AMERICAN ARTISAN

WARM AIR HEATING - - SHEET METAL CONTRACTING
RESIDENTIAL AIR CONDITIONING

JUNE, 1944

The Mid-Year Status of Heating Equipment - - - - - - - - - - Page 41
The New Manpower Regulations - - - - - - - - - - - - - - Page 54
American Artisan's Survey of Heating Equipment Service - - - - - - Page 61

DID YOU KNOW Paul Revere WAS A Tinsmith, TOO?

That man tried everything. Midnight riding, dentistry, powder making, silversmithing, coppersmithing and tinsmithing. In other words, Revere had what it takes to make good.

. . . You have what it takes, too, when you have Lamneck Furnace Pipe and Fittings!

Do you know — your jobber is again stocking *Lamneck galvanized gravity furnace pipe and fittings* for repairs and replacements? They are of the same pre-war quality, perfect fit and easy to install.

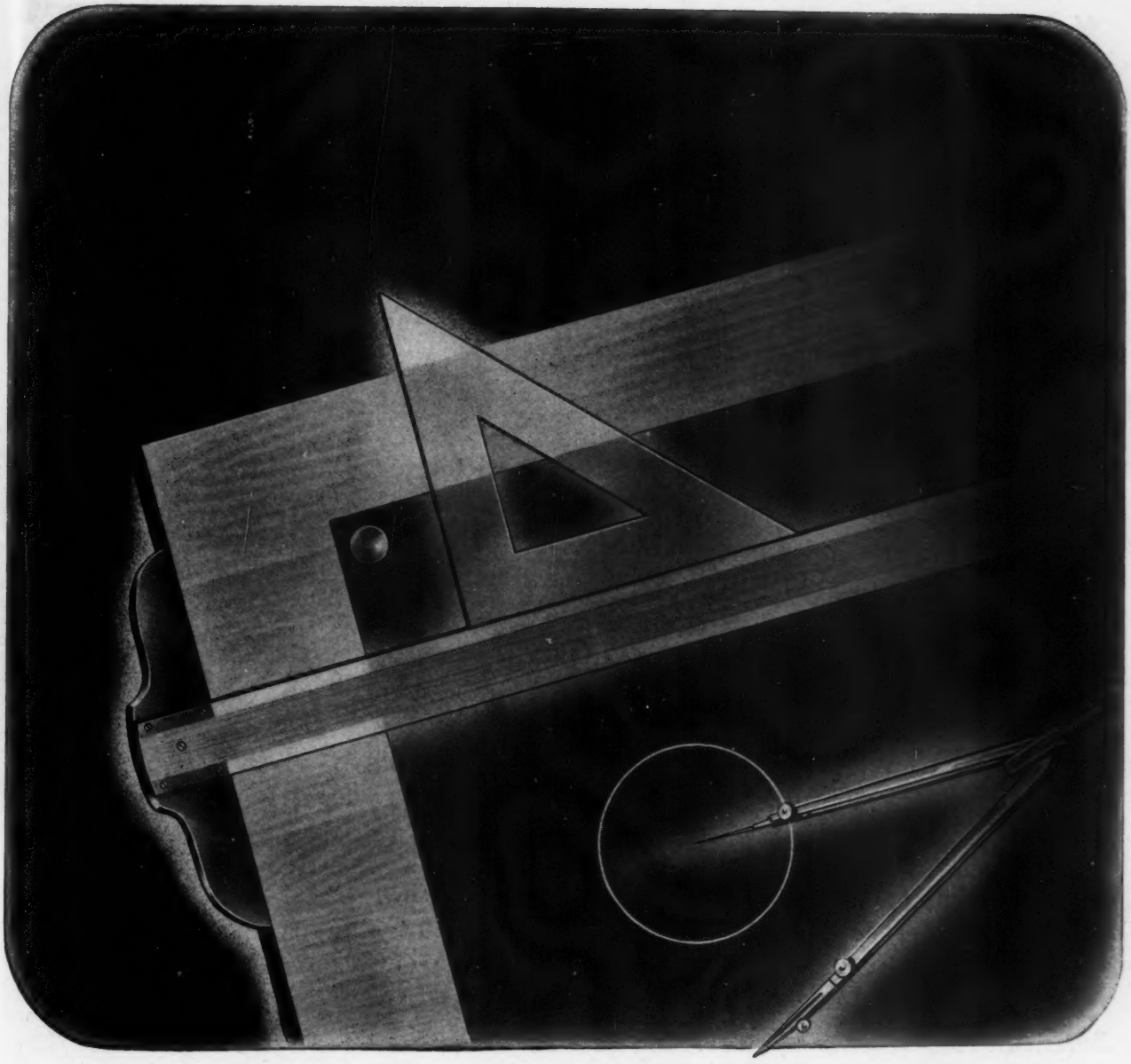
Ask your jobber for the new *Lamneck illustrated price sheet.*

When building is resumed, Lamneck will again manufacture the famous Series 700 Forced Air Duct and Fittings that will save you money . . . insure your profits . . . and boom your business.

LAMNECK PRODUCTS, Inc.

MIDDLETOWN, OHIO

LP INC.



TODAY'S PLANS...

The tremendous demand for USAIRCO equipment for essential civilian and governmental use has been a constant source of stimulation to our planning and engineering research staff. And the improved efficiency of our current production is eloquent testimony that the name USAIRCO will continue to stand for the finest in air conditioning.

Your inquiries for present and future deliveries will be promptly answered. You can get prompt shipment *now* on blowers, coils and heaters.

UNITED STATES AIR CONDITIONING CORPORATION

NORTHWESTERN TERMINAL • MINNEAPOLIS, MINNESOTA

BLOWERS • COILS • COOLING SYSTEMS • EXHAUSTERS • FANS • HEATERS • WASHERS • WHEELS

AMERICAN ARTISAN

WITH WHICH ARE MERGED

FURNACES & SHEET METALS

AND

Warm-Air Heating

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

J. D. Wilder, Editor — A. A. Kennedy, Assistant Editor

Vol. 113, No. 6 — June, 1944 — Founded 1880

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In This Issue

THE fifth War Loan begins June 12 and closes July 8. The goal is 16 billion dollars, of which 6 billions will be sought from individual investors—you and me. The total invested in our country's bonds to see the war through to Victory, to date, is 87 billions of dollars, of which individuals bought 32½ billions since Pearl Harbor. 27 millions of Americans are putting almost 10 per cent of their earnings into war bonds—at the rate of 475 millions each month.

You can buy Fifth War Loan bonds—you will be asked to buy—you must buy, if we are to pay for this war. This is the month to buy Fifth War Loan bonds—buy now!

• • •

For two months American Artisan has been trying to get from Washington agencies release of information showing the situation in materials and latest rulings on sales of heating items. The original data were secured in Washington in April, but have been re-written several times since, as regulations changed or orders were amended. In this issue, beginning on page 42, we present the latest data on furnaces, blowers, controls, warm air pipe and fittings, registers and faces, motors. The situation for each item—both materials for production and how we can sell—is, we believe, up to date to June 1.

• • •

At least 1,000 readers will remember getting from us about two months ago an 8-page questionnaire (we out-Washingtoned Washington). Eight hundred readers either didn't answer, or don't do heating work, or didn't fill in the particular parts reported in this issue, but about 200 questionnaires were returned with usable information on Manpower, Filters, Blowers — on page 61 you will find—what the problem is, how we do service, what we charge, what kind of men we have—etc. To those who replied—our thanks. Other reports will follow.

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Improved foundry facilities have helped maintain wartime service to MUELLER FURNACE DEALERS

EVEN while engaged in substantial war production—and in the face of material restrictions and labor shortages — Mueller has made an earnest effort to take care of their customers' requirements, especially on coal-fired cast-iron furnaces.

The Mueller organization was not satisfied with merely "*wanting* to do something" for its customers, who in turn were doing their best to provide an essential service to the public under trying conditions. Action was taken — resulting in improved foundry facilities which have permitted reasonably normal service.

As fast as restrictions are lifted on materials and the use of fuels, the Mueller plant is in a position to supply automatic equipment as well.

It pays to be associated with a nationally-known company that demonstrates, by performance in an emergency, that it has its customers' interests at heart. Look to Mueller for continued leadership in the post-war period. *L. J. Mueller Furnace Co., 2010 W. Oklahoma Ave., Milwaukee 7, Wisconsin.*

MEMBER I.C.I. INDOOR CLIMATE INSTITUTE DIVISION OF WINTER INDOOR COMFORT

D-41

MUELLER *Climatrol*

HEATING AND WINTER AIR CONDITIONING

Certified TYPE R-G

All steel body of this popular furnace is electric arc welded with front welded on to the body to save installation costs. High combustion chamber permits proper combustion of fuel. Heavy, boiler type grates provide efficient and economical use of coal, coke or wood. Radiator is baffled on inside so that all possible heat is absorbed from gases before leaving the furnace. Boiler plate steel connecting collars between the body and radiator provide same expansion and contraction, thus avoiding stress and strain set up between steel and cast iron.

GRAVITY STEEL FURNACE

IN SIZES FROM 22" TO 36"
IN DIAMETER

★

EXCLUSIVE DISTRIBUTORSHIPS

NOW BEING OFFERED

Exclusive distributorships are now being offered in metropolitan areas. Write for details that will help you get set for profitable post war business.

LEADER PIPE AREA 480 TO 1,300 SQUARE INCHES

•

SCHEDULE SHIPMENTS NOW

FOR SUMMER AND FALL DELIVERY

•

WRITE FOR INFORMATION AND PRICES

ELECTRIC ARC WELDED

•

GAS TIGHT

•

SMOKE PROOF

•

EXTRA LARGE FEED AND ASH REMOVAL DOORS

•

STRONG, STURDY ROCKER TYPE GRATES

•

WAIST HIGH SHAKER HANDLE

•

INFORMATION ON LARGE SIZE FURNACES RANGING FROM 500,000 TO 4,000,000 BTU's FURNISHED ON REQUEST.

A HEAVY, RUGGED, STEEL CONSTRUCTED WARM AIR FURNACE FOR ECONOMICAL SERVICE AND HEATING SATISFACTION

Stainless & Steel PRODUCTS COMPANY
1000 BERRY AVENUE
SAINT PAUL MINNESOTA

That California Sunshine doesn't know when to stop

. . . so Allen Engineers Took a Hand

In the making of wine the period of fermentation is critical and the temperature of the fermenting grapes must be under control if good wines are to be produced. The best of grapes can produce very poor wine if the fermentation is not closely watched and controlled. In California's great Central Valley the temperatures are not infrequently around 115°F for fairly long periods. Handling large quantities of grapes and keeping the temperature down during fermentation becomes an engineering problem. Such was the problem that faced California Grape Products Company producers of *Victor H.O.L. Brand California Wines*. At their winery near Delano, California fermentation took place in large concrete vats in which the greater part of the heat was dissipated to water circulated through copper coils in the tanks. Some heat, however, rose to the top of the building where the heat from the sun is also considerable. California Grape Products Company engineers recognized this and wished to provide some positive means of heat removal independent of wind or weather. Allen Corporation engineers were consulted. As a result Allen Type "H" Roof Fans were installed. Temperatures are now held at levels that insure a good product and controllable by the Vintner in charge. Allen ventilation engineers are at your service, too. *The Allen Corporation, 9751 Erwin Avenue, Detroit 13, Michigan.*

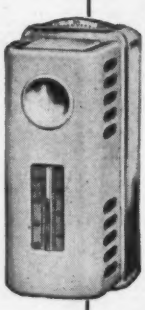
THE *Allen* CORPORATION

ENGINEERED VENTILATION FOR INDUSTRY

"RUN IN" LIKE A QUALITY MOTOR CAR . . .

8 EXCLUSIVE FEATURES OF WHITE-RODGERS HYDRAULIC-ACTION TEMPERATURE CONTROLS

1. May be mounted at any angle or position, above, below or on level with control point.
2. Hydraulic-Action Principle incorporating solid-liquid filled bulb and capillary provides expansion force comparable to that of a metal bar.
3. Diaphragm motion uniform per degree of temperature change.
4. Power of solid-liquid charge permits unusually sturdy switch construction resulting in positive contact closure.
5. Heavier, longer-wearing parts are possible because of unlimited power.
6. Dials are evenly and accurately calibrated over their entire range because of straight-line expansion.
7. Controls with remote bulb and capillary are not sensitive to change in room temperature. Accuracy of control is not affected by temperature changes in surrounding area.
8. Not affected by atmospheric pressure. Works accurately at sea level or in the stratosphere without compensation or adjustment.



to assure accurate performance the moment it is installed

Hour after hour this specially designed cycling machine breaks in White-Rodgers control-switch mechanisms. Each is operated for not less than five hundred cycles to assure smooth, uniform contact action.

Just another reason why White-Rodgers Controls are accurate when you install them—need no recalibration due to flexing of moving parts or seating of bearing surfaces.

Specify White-Rodgers to assure dependability and freedom from trouble.

HYDRAULIC ACTION CONTROL — MEMBER — R — I.C.I. — INDOOR CLIMATE INSTITUTE

WHITE-RODGERS
ELECTRIC CO.

1215F Cass Ave. St. Louis, Mo.

Controls for Refrigeration • Heating • Air-Conditioning

YOUR ANSWERS *Are The* INGREDIENTS

What you, the furnace trade, want in product and policy . . . what you have told us in your answers to our recent questionnaire . . . is what we're cooking with! * You may be sure that the final dishes . . . *the MOR-SUN furnaces and the MOR-SUN policy* . . . will contain the ingredients of your ideas for a new and revolutionary line of furnaces and a mutually profitable dealer-manufacturer policy!

*By the way, we're cooking with ALL fuels!

"The Sun Never Sets with MOR-SUN!"

MORRISON STEEL PRODUCTS, INC. BUFFALO 7, N. Y.

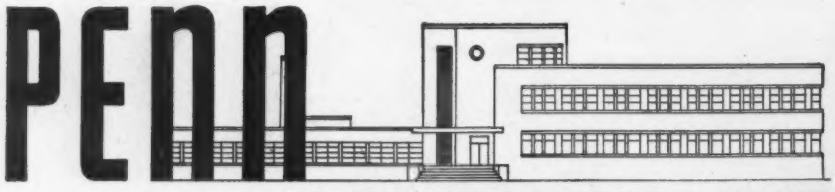
ACT NOW TO HELP SAVE NEEDED FUEL NEXT WINTER

Fuel supplies for next winter's heating season threaten to be far below normal demands. More than ever before, this means that *fuel waste must be eliminated!* Every home heating plant must operate at top efficiency to extract every B.T.U. of heat from the available quota of fuel.

National publicity on fuel conservation is making your customers fully aware of the situation. To accomplish this goal, however, *the skill and experience of every heating dealer is urgently needed.* You can begin right now... during the summer months... to schedule your work before the early winter rush when customers will clamor for service. Careful checking and reconditioning of heating systems in your vicinity can *save up to 15 or 20 percent in fuel.* And remember..."Fuel Saving *Starts* With Control!" Adjust the automatic controls, repair or replace them when necessary and sell new controls where they will provide increased economy and safety.

Penn is fully prepared to cooperate. If you need repair parts or new controls, we can make prompt shipment on most of our standard models. Preference ratings of AA-5 or higher are required BUT REMEMBER, the L-79 order makes it easy for the installer and jobber to establish and extend AA-3 ratings. *Act now*... check your control stock and *order the items you will need from your wholesaler. Penn Electric Switch Co., Goshen, Indiana.*

In Canada: Powerlite Devices, Ltd., Toronto, Canada.



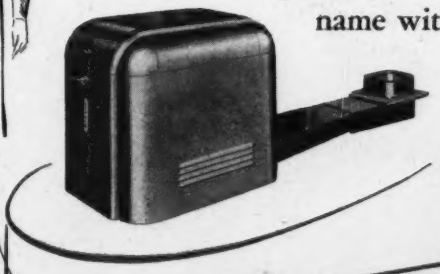
PENN

AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

A GOOD BUY FOR THEM IS A GOOD SALE FOR YOU

CONCO's post-war line will deliver what post-war buyers want — service, comfort, economy, convenience, long life from a modest initial investment. Any line that delivers less will not be a good buy for them, or a good sale for you. Watch CONCO — it's the name with a future — for YOU!

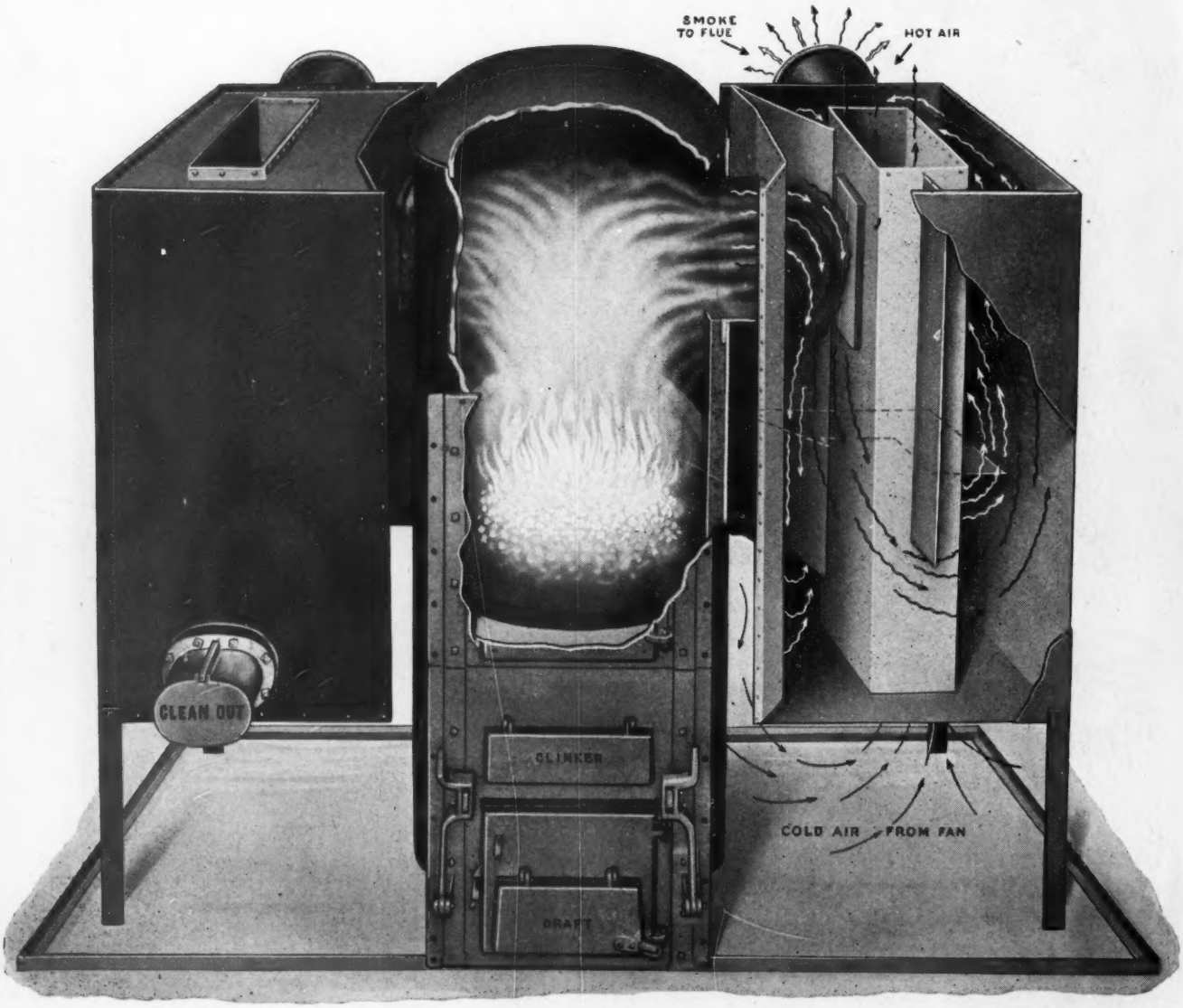


CONCO

Division of H. D. Conkey & Company, Mendota, Ill.

A SIZE AND TYPE FOR EVERY HEATING REQUIREMENT

PEERLESS *Commander* Heavy-Duty FURNACE



SPECIFICATIONS — PEERLESS *Commander* No. 750 DR

Diameter Drum (obround)	Height of Drum	Height of Radiator	Grate Area Sq. In.	Grate Area Sq. Ft.	Heating Surface Sq. In.	Heating Surface Sq. Ft.	Ratio Heating Surface to Grate Area	Height to Bottom of Smoke Pipe Collar	Diameter Smoke Pipe	Casing Size	Casing Height	Shipping Weight—Lbs. Less Casing	Shipping Weight—Lbs. With Casing
31½"x48"	66"	46"	1048	7.28	30,959	215	29.55	49½"	14"	91"x58"	75"	3340	3855

FORCED AIR RATINGS

BTU-Coal	Firing Rate Lbs. Per Sq. Ft. Grate Surface	BTU	BTU-Coal	Firing Rate Lbs. Per Sq. Ft. Grate Surface	BTU
11,500	7.5 10.0	486,000 698,000	12,500	7.5 10.0	528,000 759,000
12,000	7.5 10.0	507,000 728,000	13,000	7.5 10.0	549,000 789,000

Specifications on other Peerless Heavy Duty furnaces on request.

Wire or Write for Descriptive Literature and Complete Information on other sizes of Peerless Warm Air Furnaces.

THE PEERLESS FOUNDRY COMPANY, Indianapolis, Ind.

Pioneers in Warm Air Heating for Over a Third of a Century

Climate... enemy or friend

"DL" Products Help Make The Difference

Climate is a friend if it helps *us*, or hinders the enemy. Climate is an enemy if the reverse is true. It has been a factor in every war—an exceptionally powerful factor in this war. Almost every extreme and rigor is encountered in world-wide operations, affecting every military element from troop movement to photo reconnaissance.

Thousands of "DL" Float Valves have been furnished to the armed forces for use on space heaters, furnaces, tent heaters, water heaters, etc., to help nullify climate's handicaps.

"DL" Float Valves are much in demand by manufacturers of heating equipment, because of their simplicity, ease of cleaning and servicing—important advantages to troops in the field. "Automatic Temperature Compensation", an exclusive "DL" feature, makes their operation extremely reliable by automatically maintaining uniform oil flow regardless of temperature.

It is not too soon to be thinking about the line of heaters you will sell in postwar competition after the war. Be sure to select one equipped with "DL" Float Valves which have already won an enviable reputation.

DETROIT LUBRICATOR COMPANY *General Offices:* **DETROIT 8, MICHIGAN**

Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

Canadian Representatives—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

"DL" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • Radiator Valves and Balancing Fittings • Arco-Detroit Air and Vent Valves • "Detroit" Expansion Valves and Refrigeration Accessories • Air Filters • Stationary and Locomotive Lubricators

HEATING EQUIPMENT *Plus!* THAT'S LUXAIRE

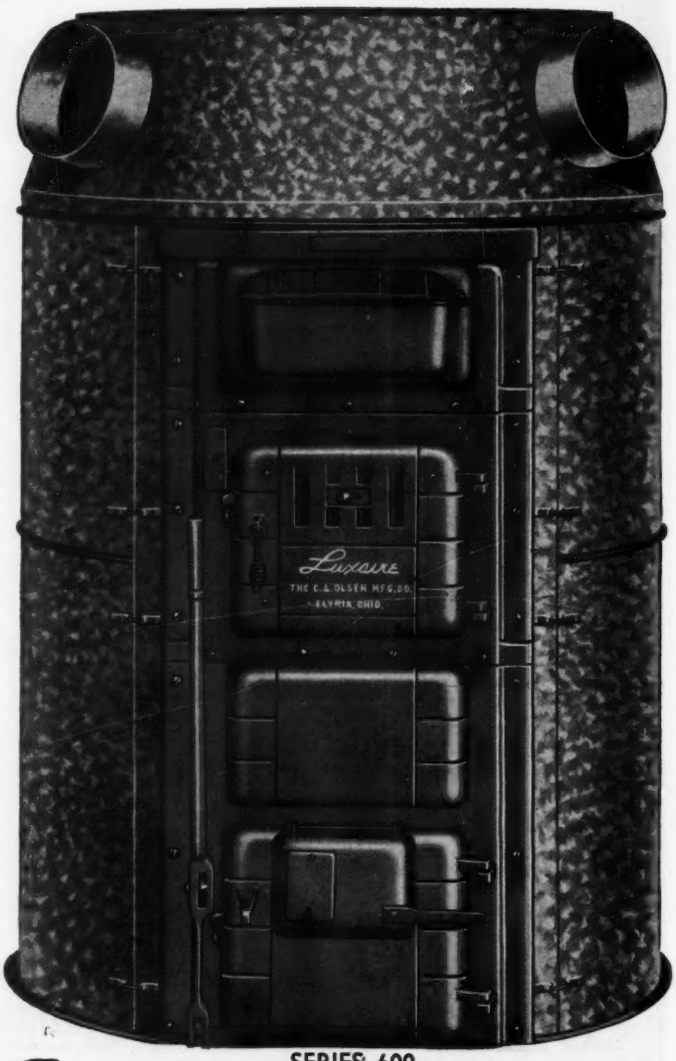
LUXAIRE furnaces were outstanding before the war. After the war they will reflect wartime knowledge of ways and means of better, faster, stronger and more economical manufacturing.

Throughout the war years, Luxaire research and development engineers have been planning, developing and testing new ideas that assure superior Luxaire products.

Heating Contractors! Looking ahead is the order of the day! Prospective home builders and many present home owners are looking ahead to heating systems of advanced design and construction.

Heating Contractors! NOW is the time to look ahead! To tie in with Luxaire's complete line of heating equipment! Equipment that embodies "years ahead" principles in design and construction.

You'll be "Dollars Ahead" with Luxaire's "Years Ahead" warm air heating and air conditioning equipment.



SERIES 600

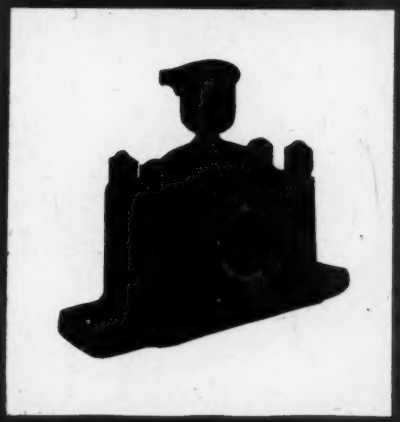
Luxaire

BUY MORE WAR BONDS AND STAMPS

WARM AIR FURNACES . . . AIR CONDITIONING . . . COAL . . . GAS . . . OIL

THE C. A. OLSEN MANUFACTURING CO. ELYRIA, OHIO

Randall PILLOW BLOCKS



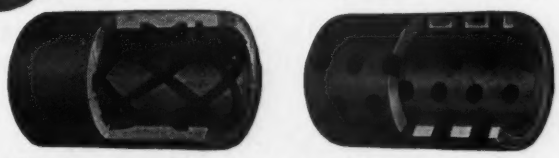
For Longest Trouble-Free Service

RANDALL engineering research has been concentrated on *your* bearing problems for more than a third of a century. It is no wonder, therefore, that Randall Pillow Blocks are used more than any other on air handling equipment.

Randalls mean an end to noisy, uncertain operation, to replacement labor and expense. When air handling units are Randall equipped it means you are assured of the longest possible trouble-free service.

They operate quietly because they're engineered for air handling work. They're self-aligning, self-lubricating. They're economical. For a big measure of extra bearing satisfaction, install Randall equipped units.

Write for Randall Catalog No. 42 today.



Cut-away sections of two of many types of Randall Graphite Bronze Bearings. Send for complete Graphite Bronze Bearing catalog. No. GB-43.

RANDALL GRAPHITE PRODUCTS CORPORATION

Dept. 110 609 W. Lake St. Chicago, Ill.

YOU CAN depend on WEIR-MEYER leadership in postwar heating. In spite of necessary concentration of engineering, design and production upon Military and other war needs, new developments for civilian requirements are taking shape.

Postwar WEIR-MEYER Modern Heating will be truly modern — and practical. It will be styled for modern homes. And above all, it will perform to the enthusiastic satisfaction of home-owners.

Inquiries from Distributors and Dealers who want to serve their communities better — and profitably — are welcomed.

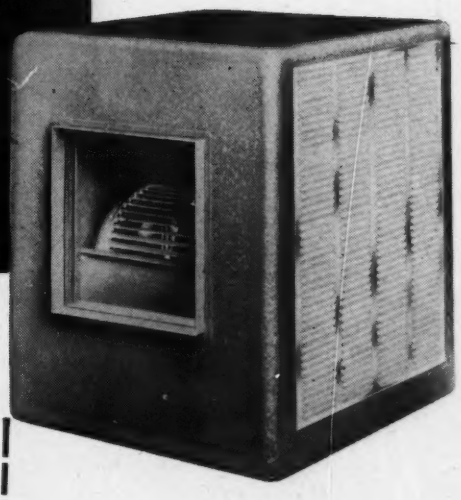
Limited quantities of WEIR-MEYER furnaces for replacement are available now. Write.

THE MEYER FURNACE CO.
Manufacturers of
WEIR and MEYER FURNACES—AIR CONDITIONERS
for **COAL - GAS - OIL**
PEORIA 2, ILLINOIS

WEIR-MEYER MEANS *Modern Heat*

UTILITY

EVAPORATIVE AIR COOLERS



Utility Evaporative Air Coolers are available on AA5 or better priority without authorization from WPB with certain exceptions.

Coolers may be stocked for inventory or re-sale by obtaining approval from War Production Board on Form WPB-547 (PD-1X).

For exceptions and complete information, consult your local WPB office and ask for Order L-38 as amended May 10, 1944.

Principles of Evaporative Coolers

The origin of cooling by evaporation is lost in history, but its application to evaporative air coolers is truly modern.

The principle of evaporative cooling is the same as a breeze off the ocean—the moving air is cooled by evaporation to bring relief and comfort in hot weather. As temperatures increase, the effect of the cooling becomes more pronounced.

Utility Air Koolers use a quiet, efficient blower to draw air through pads that are kept uniformly moist by an ingenious distribution of moisture. This cool, filtered air is discharged in a smooth stream to reduce the temperature throughout an entire room or building.

Utility Propeller Fans and Centrifugal Blowers are also available in accordance with WPB regulations. We will be glad to furnish complete information and literature.

UTILITY FAN CORPORATION

4851 South Alameda • Los Angeles 11, California

Peace-time manufacturers of the Famous Utility Air Koolers, Blowers, Fans, Floor Furnaces, Circulating Heaters, Unit Heaters, Forced Air Furnaces.

MILES OF DUCTS like these have been assembled by E-G Sheet Metal Works with P-K Self-tapping Screws. They also use many thousands of P-K Damper Controls, and say: "Just as dependable in performance as P-K Screws".

Like most sheet metal men, the E-G Sheet Metal Works of Paterson, N. J., discovered years ago that P-K Type "A" Sheet Metal Screws are an indispensable short cut to faster, cheaper stronger assemblies. Today, the time they save over riveting, bolting and other complicated fastening methods builds up the extra man-hours needed to meet pressing war construction schedules.

But there's another reason why E-G always specifies Parker-Kalon.

"We've found that P-K Sheet Metal Screws always run uniform . . . all alike in quality. The heads never pop off, and they can be depended upon to hold tight. We tried others, but always came back to P-K!"

Parker-Kalon's unequalled Quality-Control routine makes the difference. A complete checkup of every physical and mechanical characteristic makes sure you get no "doubtful screws"– screws that *look* all right, but some of which fail to *work* right.

KNOW ALL SEVEN of the P-K Fastening Devices so useful in sheet metal assembly. Make fastenings easier . . . faster . . . better – in light and heavy metals – to brick, concrete, etc. – or sheet metal to wood. Tell us what you want to fasten and we'll send you samples for trial. Parker-Kalon Corp., 208 Varick St., New York 14, N. Y.

TYPES FOR EVERY METAL FASTENING JOB

PARKER-KALON

Quality-Controlled

SHEET METAL SCREWS

VIKING'S POST WAR PLANNING FILE FOR DEALERS

FORCED AIR

CAN PUT MONEY IN *Your Pocket!*

HERE'S WHY YOU'LL PROFIT!

1. THE MARKET IS TREMENDOUS—Up to Pearl Harbor over 9 million gravity furnaces were in use in the United States. During the war many thousands of low priced homes have been built which normally would have used forced air systems but were restricted by priorities. These homes are all ripe prospects for you.

2. THE VIKING BLOWER IS PROVEN EFFICIENT—Superior research and engineering facilities have made Viking blowers the choice of America's greatest furnace manufacturers. A Viking Blower Package will convert any furnace installation into a modern winter air conditioning system to be adapted to any home.

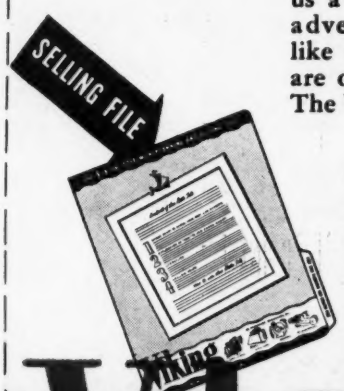
3. VIKING SALES HELPS MAKE SELLING EASY—Dealer helps include literature and displays for the homeowner and for you that show what forced air heating is, how Viking Blowers operate and how to sell them.

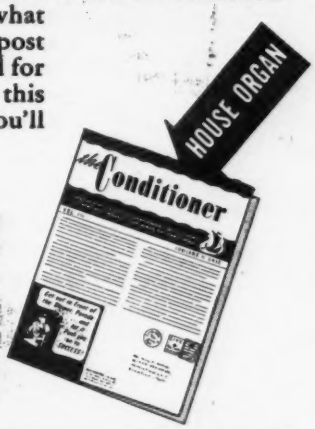
See How We Train You Now At No Cost to

BE A BLOWER DEALER!

● To help you, get the profits you can get from Blower sales, we have started a special training course that you can enroll in at no cost to you. If you are interested, just write us a note that you saw this advertisement and would like to get the material we are offering.

The Viking course in winter air conditioning consists of regular mailings of educational material. This material will teach you what you should know about winter air conditioning, how to sell it and what to do now to line up post war business. Be prepared for peacetime markets. Grab this chance to get ready. You'll not be sorry.



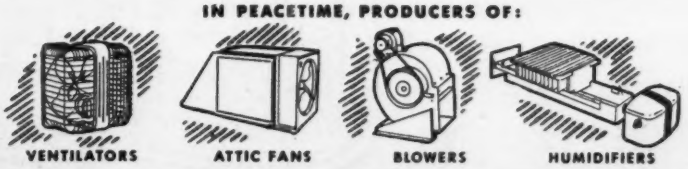


GET BOTH FREE

We will send you this FREE Data File, chock-full of information to show you how you can make good money from Blower sales. Study it—keep it—use it—without obligation. Tells you the 17 things you can do now . . . today to help get post war business. Gives you selling helps, priority information, and literature to use now and later. And with it we will send our new 2-color house organ, the first in the industry to tell you how to sell Forced Air Heating, and to give you pertinent news about business conditions that will affect you. It describes how Dealers can learn now to make good money as Blower Dealers.

Viking

IN PEACETIME, PRODUCERS OF:

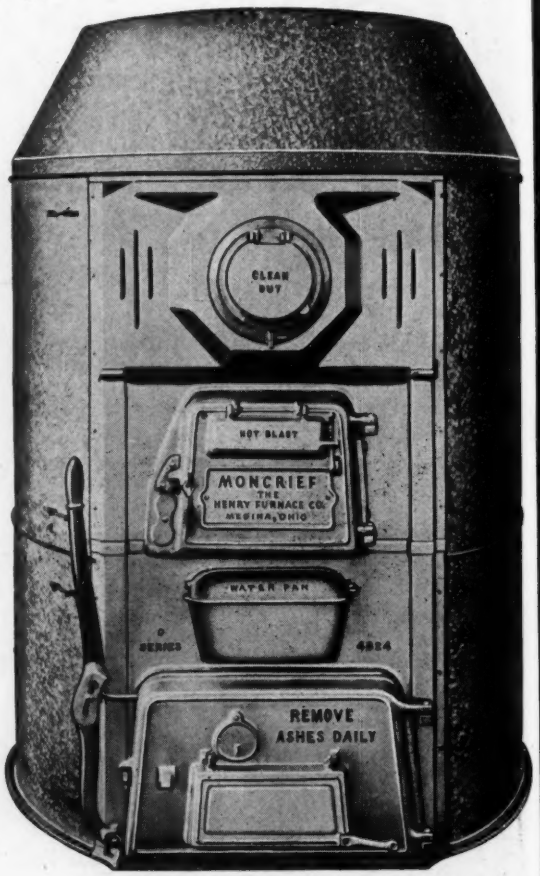


AIR CONDITIONING CORPORATION • 5600 Walworth Avenue • Cleveland 2, Ohio

In 3 Post-war Periods

★ ★ ★ ★ in 1898
★ ★ ★ ★ in 1918
★ ★ ★ ★ in 194?

MONCRIEF
ALWAYS A LEADER



SERIES-C Coal Burning, Hand Fired Furnace

After the Spanish-American War, Moncrief was a leader . . .

After World War I, Moncrief was a leader . . .

After World War II has been won, Moncrief leadership again will be outstanding.

Back of Moncrief products are almost 50 years of "know how". Thousands upon thousands of Moncrief furnaces have dependably served home owners, year in and year out—quite a record.

Moncrief furnaces have proven durable, efficient and economical to own and to operate. Moncrief is truly the biggest dollar value possible in heating.

Thousands of Heating Contractors have succeeded by supplying and maintaining Moncrief's reliable, economical heating service.

Be a leader with a leader — MONCRIEF.

MONCRIEF
SINCE 1895

WARM AIR FURNACES
FURNACE PIPE and FITTINGS

AIR CONDITIONING SYSTEMS
FOR COAL . . . GAS . . . OIL

THE HENRY FURNACE CO. **MEDINA, OHIO**

A LOT OF WATER OVER THE DAM

Looking back over the years, the flow of business through our books since we started in 1859 represents thousands and thousands of transactions, large and small —"a lot of water over the dam".

In good weather and bad . . . riding the crests of prosperous times and plowing through the troughs of depression and war . . . we have made the best of conditions and served our trade continuously to the limit of our ability for 85 years. In all that time we have stuck to the job without interruption, with the thought uppermost that the customer deserves the best service we can give him under all conditions, because this business cannot endure and prosper unless the customer knows he can depend on our wholehearted co-operation. That's the OSBORN policy and pledge. Time has proved that it works.

THE J. M. & L. A.

OSBORN Co

CLEVELAND, OHIO

BUFFALO • CINCINNATI • DETROIT

Manufacturers—Distributors of Metals and Metal Products

PRIME METAL SHEETS · EAVES TROUGH · CONDUCTOR PIPE, ETC. · ROOFING · NAILS AND PAINTS · FURNACES AND ACCESSORIES · SHEET METAL TOOLS AND MACHINERY

A DEPENDABLE SOURCE OF SUPPLY FOR 85 YEARS

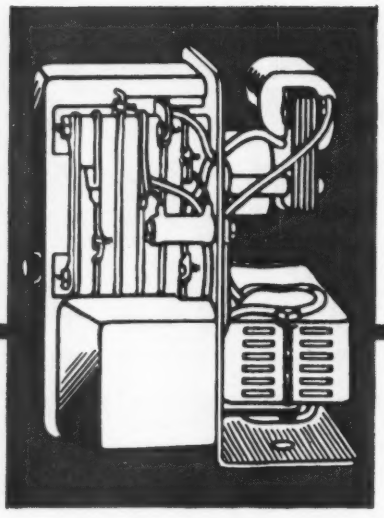
For G-E dealers—an open door to big sales in the postwar heating market

ONCE the war is over, the alert dealers who carry the G-E Automatic Heating Equipment line will have a big advantage in a busy market. It's the advantage that will come from selling equipment of proved efficiency... backed by the prestige of the G-E name... incorporating the latest engineering improvements developed by G-E research and wartime experience.

Just *how* postwar G-E Heating Equipment will differ from prewar models cannot be disclosed now. But one thing *can* be said: G-E's current research promises to result in heating units that will be quiet, compact, efficient... easy to install, and even more important, easy to *sell.*

Plan *now* to tie in with this postwar sales-opportunity line. *General Electric Company, Heating Division, Section 4536, Bloomfield, New Jersey.*

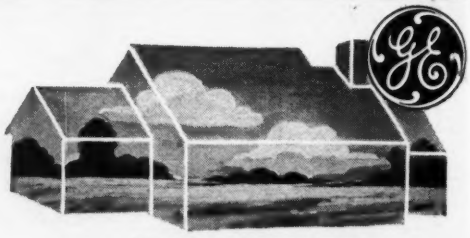
☆ BUY WAR BONDS ☆



THE G-E MASTER CONTROL—One of the many outstanding selling features in prewar G-E heating units. The "brain" of the control system, the Master Control starts and stops the mechanism with the precision and accuracy possible only with electric motorized timing—an obvious advantage to users, and a powerful sales tool for dealers. From today's research at G-E will come many other equally important user benefits that will mean *new sales opportunities* for G-E dealers.

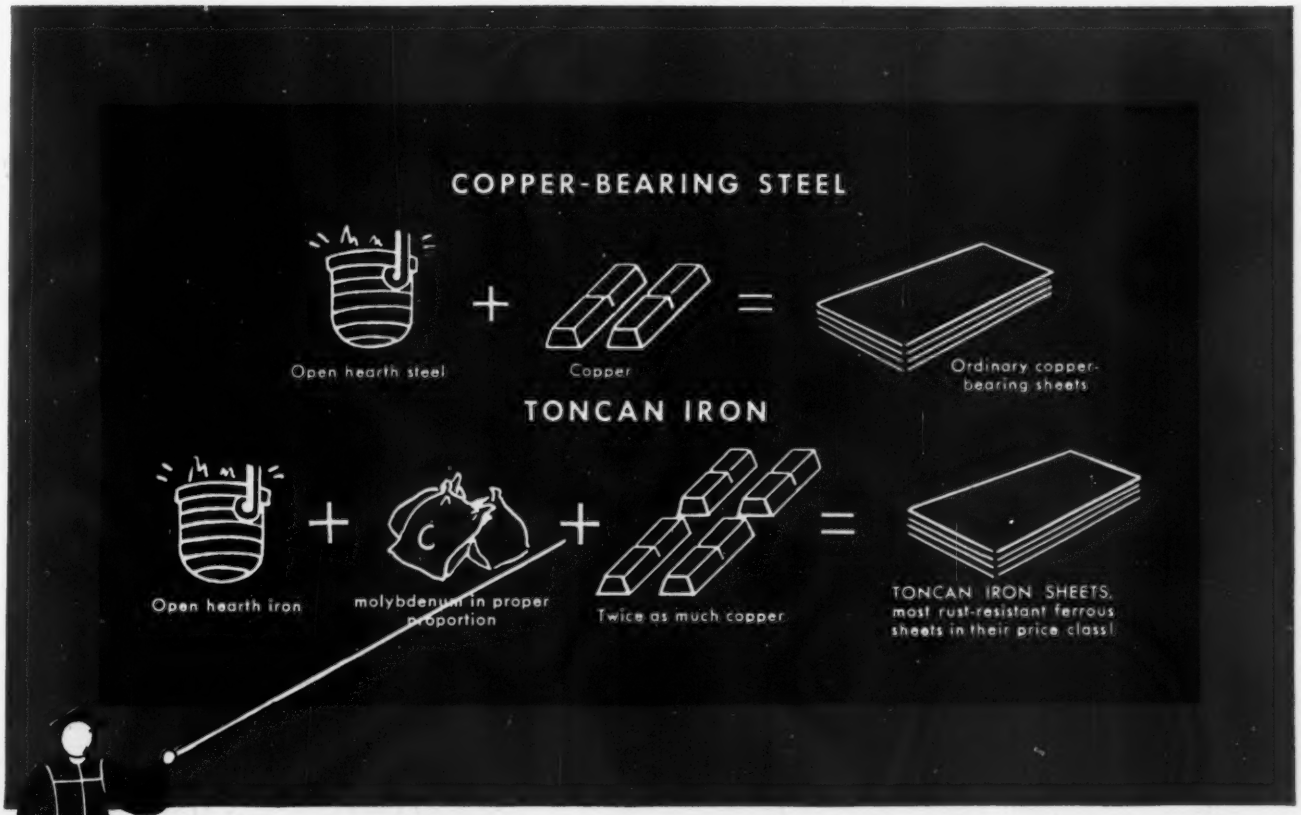
Automatic Heating by

GENERAL ELECTRIC



"CONTROLLED WEATHER"

Hear the General Electric Radio Programs: The "G-E ALL-GIRL ORCHESTRA," Sundays 10 P. M., E W T, N B C..."THE WORLD TODAY" News, Every Weekday, 6:45 P. M., E W T, C B S



It's the TWO Plus Signs that give Toncan Iron GREATER RUST-RESISTANCE

Remember these two plus signs. They are a symbol of the *extra rust-resistance* that has made Toncan Iron a favorite of the sheet metal trade.

This high rust-resistance is why you can't buy Toncan Iron now. Its plus materials—*copper* and *molybdenum*—are needed for fighting weapons. And rather than make an inferior Toncan Iron, we suspended production for the duration.

But until Toncan Iron returns, remember this—there has never been another ferrous material just like it. It is an *alloyed iron*—with the greatest rust-resistance of any ferrous material in its price class. To open hearth iron, that is as free of impurities as the most expert furnace practice can make it, is added *copper* —*twice as much* as in copper-bearing steel—*and molybdenum* which makes the copper more effective.

Toncan Iron is highly ductile—*uniformly* ductile. It works and forms easily and quickly, without chipping or breaking. Its rust-resistance goes all through the metal. Welds are easily made and can be as rust-resistant as the metal.

When Toncan Iron emerges from the war you'll find it better in many ways. The new developments in ferrous materials coming from our research laboratories and from our war experience assure you of this.

So, mark Toncan Iron for follow-up when Victory is near. Until then, study the booklet "How Toncan Iron makes Money for Sheet Metal Contractors and Fabricators" which we or your Republic Toncan Iron Distributor will gladly send.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Berger Manufacturing Division • Culvert Division
Niles Steel Products Division • Steel and Tubes Division
Union Drawn Steel Division • Truscon Steel Company
Export Department: Chrysler Bldg., New York 17, N. Y.

Republic
TONCAN COPPER MOLYBDENUM IRON

Other Republic Products include Carbon, Alloy and Stainless Steels—Pipe, Sheets, Plates, Strip, Bars, Wire, Bolts and Nuts, Tubing

Then he said to himself—

"IMITATE IN GOOD THINGS"

THERE'S a sermon in the words of China's leader, Generalissimo Chiang Kai-Shek, as blue laws were clamped on his people's tendency to imitate our jitterbuggy way of life. Said he:

"CHINA IS FAR BEHIND THE WEST IN INDUSTRIALIZATION. WE WANT TO IMITATE THE WEST IN GOOD THINGS . . . WHY IN SUCH THINGS AS DANCING?"

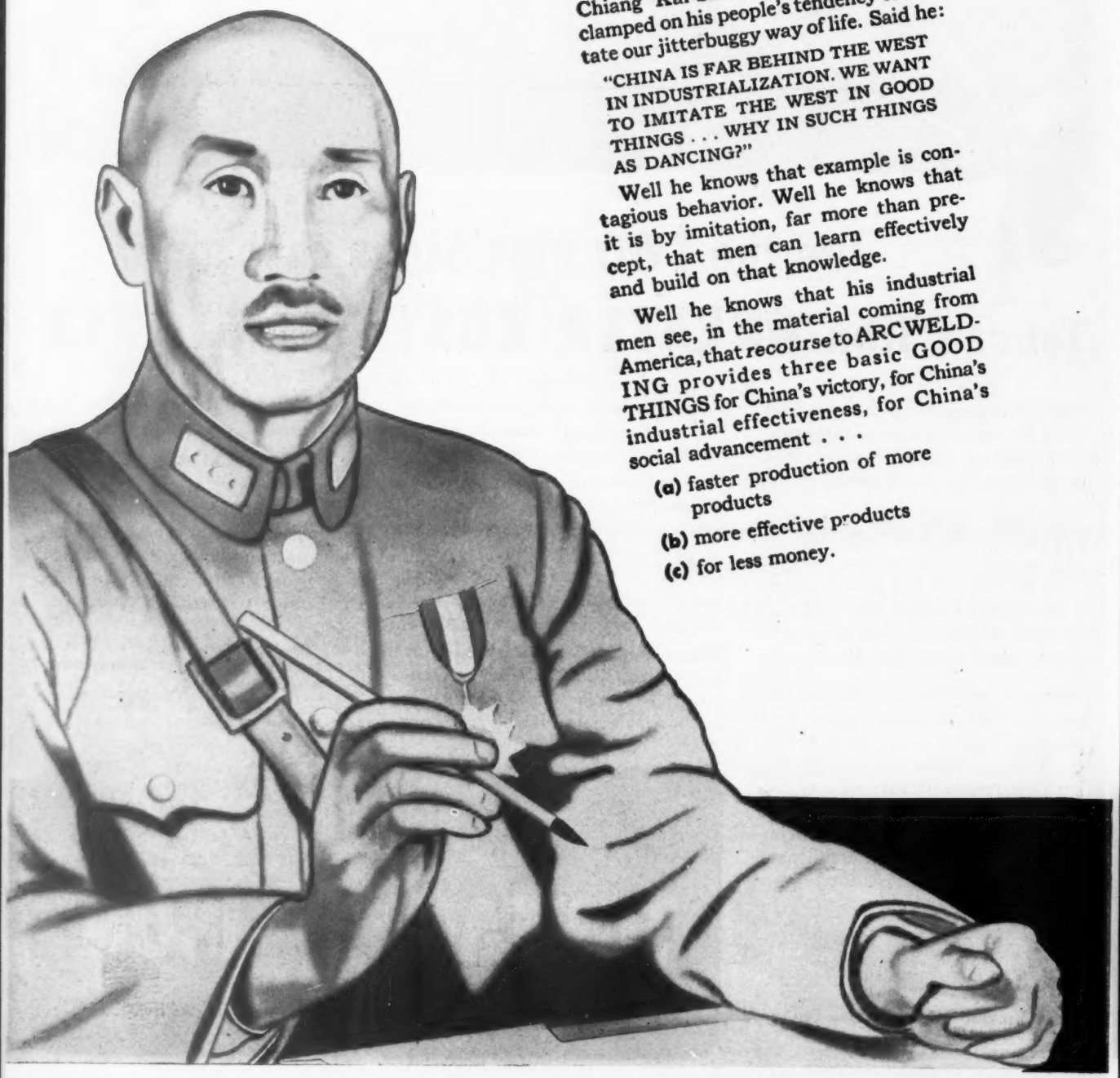
Well he knows that example is contagious behavior. Well he knows that it is by imitation, far more than precept, that men can learn effectively and build on that knowledge.

Well he knows that his industrial men see, in the material coming from America, that recourse to ARCWELDING provides three basic GOOD THINGS for China's victory, for China's industrial effectiveness, for China's social advancement . . .

(a) faster production of more products

(b) more effective products

(c) for less money.



"Imitate in good things," he says

Here, Generalissimo, is a GOOD THING to imitate . . . the *faster production* being obtained by many aggressive users of this new Lincoln development:

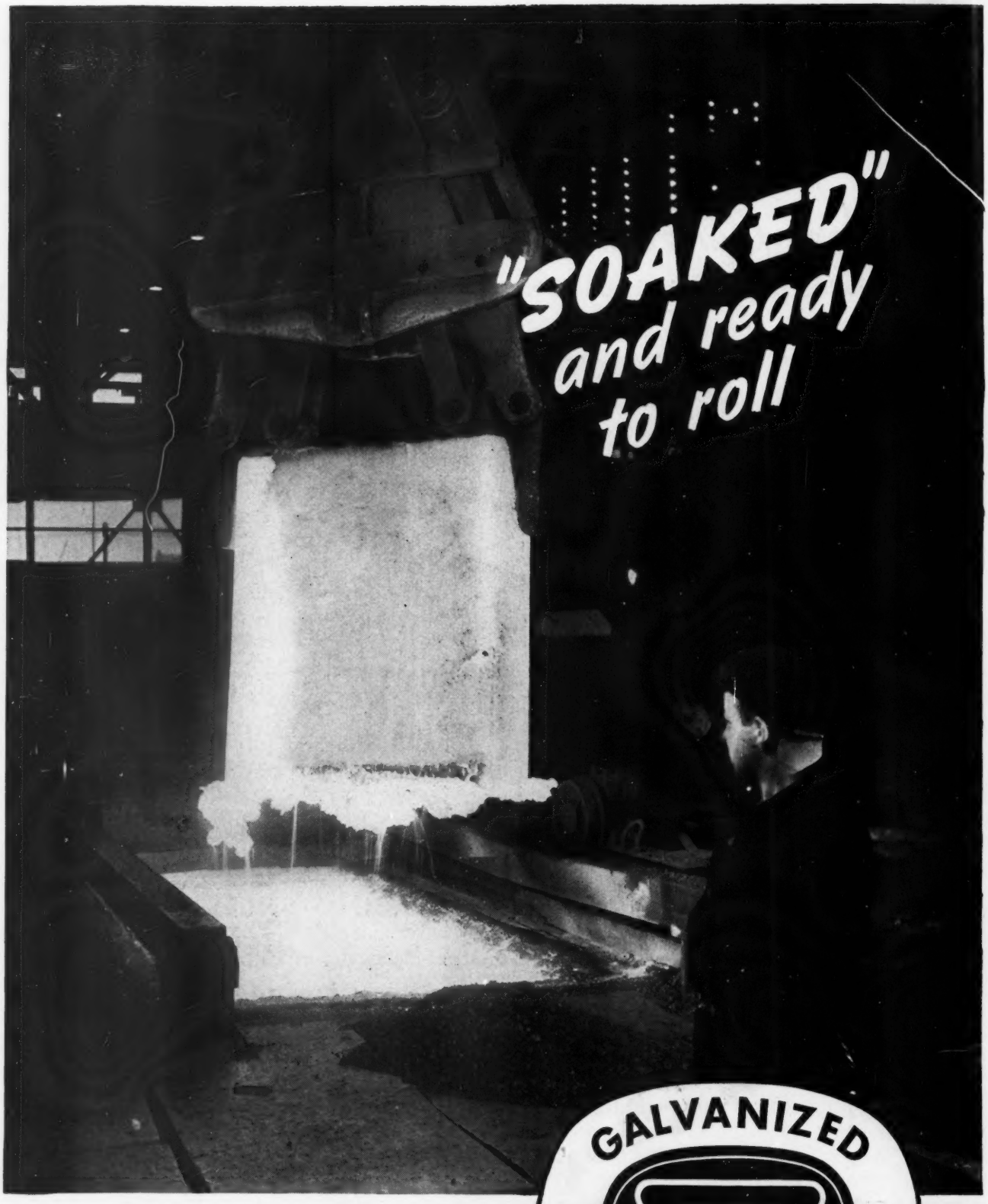
A GOOD THING IN WELDING SHEET METAL

"*Fleetweld 37*" . . . the new all-position electrode. Produces an extremely stable arc for easier welding of thin-gauge mild steel. Full details in "Weldirectory", Bul. 402. This in combination with the world famous "Shield-Arc Jr." Welder and the new "Lincontrol" (foot operated current control) makes a combination for better, faster welding of sheet metal.

THE LINCOLN ELECTRIC COMPANY • Cleveland 1, Ohio

America's greatest natural **recourse**

ARC WELDING



"Soaking the ingot" isn't just a funny phrase. It's an important step in making ARMCO Ingot Iron for durability and easy-working qualities. Here an ingot is being plucked from the white-hot pit. The temperature is uniform throughout and the iron is ready to roll on the Armco-invented continuous mill. The American Rolling Mill Co., 1641 Curtis St., Middletown, Ohio.

EXPORT: THE ARMCO INTERNATIONAL CORPORATION

FINISH THE FIGHT— WITH WAR BONDS

GALVANIZED
ARMCO
INGOT IRON

PACKAGED for PROFIT by PENN

- LOW FIRST COST WILTS COMPETITION
- 100% SELF CONTAINED . . . QUICKLY SET UP
- FEWER AND EASIER SERVICE CALLS
- ATTRACTIVE APPEARANCE . . . SALES APPEAL
- FACTORY PREFABRICATED...A PACKAGED PRODUCT

★*Factory assembly line fabrication of boiler, burner, combustion chamber, controls and wiring reduces installation cost 95% and removes guesswork 100%.*

Wide awake dealers know that post-war demands for new building and modernization will "turn on the heat" when it comes to competition. Penn Dealers will be a long jump ahead of the field . . . because Penn's self-selling features stand out clear, genuine and impressive.

Packaged by Penn means built from the ground up for dealer profits as well as owner benefit. Penn Dealers spend a minimum of time and labor on installation, have fewer, more easily satisfied service calls.

When war needs are satisfied Penn will again build the finest, low cost packaged heat. Penn invites forward looking dealers to get the complete story of Profits by Penn. Write today.

PACKAGED by PENN

- BOILER BURNER UNITS
- AIR CONDITIONER UNITS
- PENNGUN WATER HEATERS
- HYDRO-AIRE (SPLIT SYSTEMS)

PENN

In the South Pacific, over Europe, and in Alaska's bleak Interior . . .

CRESCENT TOOLS GIVE WINGS

● In more peaceful times, Crescent Tools have always enjoyed pretty much world-wide use. Very small by comparison, however, with the job of "exporting" which has been done in the past two years with the Army's very able assistance. The letters we receive, as well as action stories in the public press, convince us that the tools we could not sell you, are helping our armed forces along their hard, yet undeniable, road to Victory. Crescent Tool Company, Jamestown, New York.

In Alaska . . .

An engineer had to make a trip, by outboard motor boat, into the frozen interior. A long way from any repair shop, his motor "konked out." Without a tool kit, he had to tramp to the nearest Eskimo village. He asked the first native he met if he had a wrench. "Imagine my surprise when this Eskimo reached in his hip pocket and pulled out a CRESCENT WRENCH."

In the South Pacific . . .

Lost in a steaming jungle, a Jamestown boy struggled and fought Nature at her worst, trying to get back to the American lines. About to give up because of exhaustion, he sat down on a log. When he had shaken off the worst of his fatigue, he looked down at his feet and realized that the object his weary eyes had been focusing on was a CRESCENT WRENCH and a pair of pliers. Encouraged at the sight of a hometown product, he eventually found his way out and back to our lines.

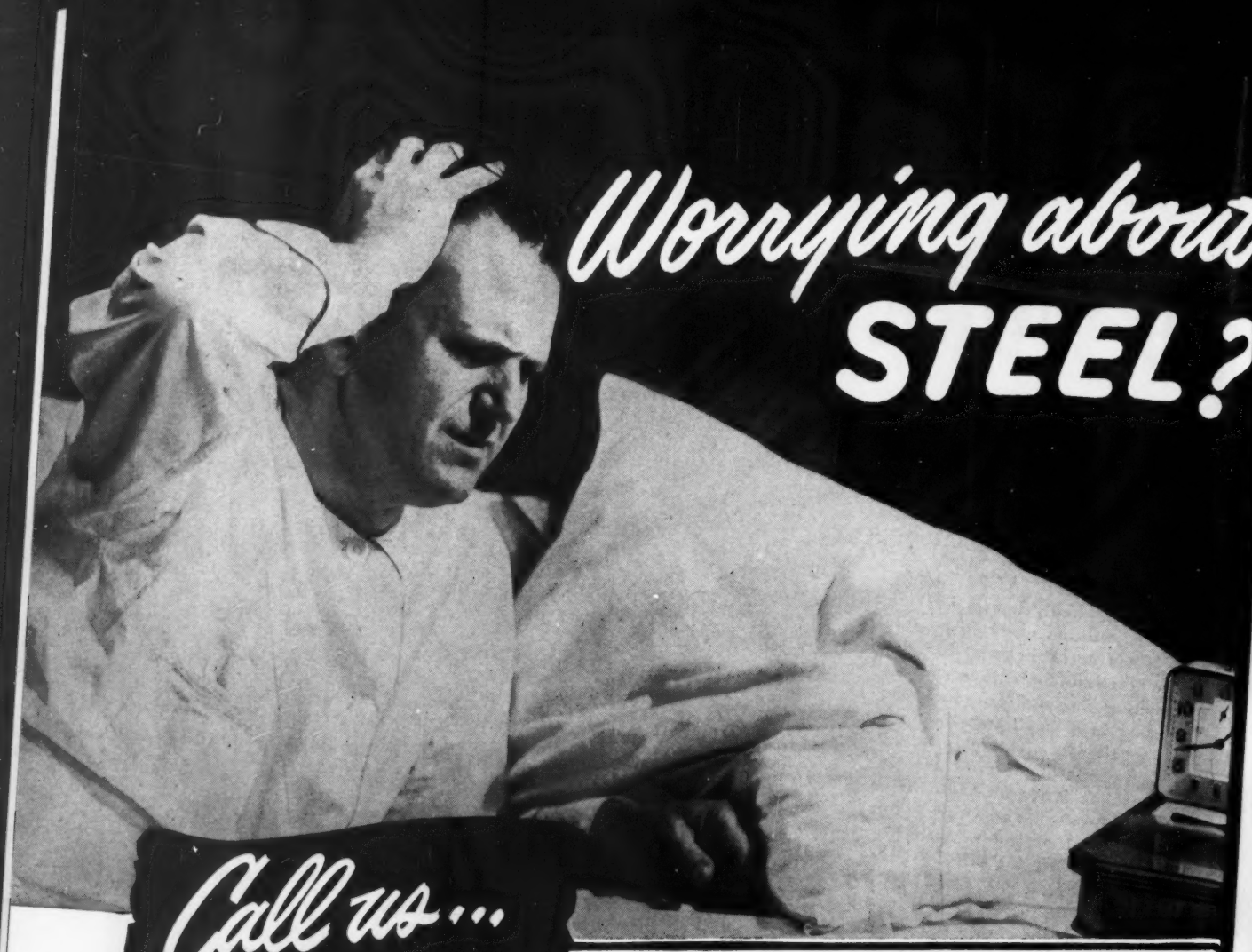
TO WORK . . . and VICTORY!

Over Europe . . .

The crew of a badly damaged Flying Fortress jettisons every disposable item of equipment in order to lighten the plane and better their chances of reaching England. They had been told in lectures that "it was impossible to get rid of a ball turret in flight." Four sergeants of the crew decided that perhaps it wasn't impossible. They went to work, and with—as the press dispatch stated—"A CRESCENT WRENCH, A PAIR OF PLIERS AND A LOT OF CUSSING," they got rid of the turret in just fifteen minutes. With their ship lightened by eight tons, the plane zoomed up and on to England, and safety.

CRESCENT TOOLS

Give Wings to Work



Worrying about STEEL?

Call us...

Like yours, our first job is to do all we can to speed war production. So, if you need steel, steel products, machinery and equipment, we'll get it to you quickly if at all possible—subject to priority requirements. A call to us has broken many a production bottleneck — helped speed many a war order.

Even today, our stocks are large. They include National Emergency Alloy Steels, which have proved so successful. Try us. We welcome your inquiries. Phone, write or wire our nearest warehouse.

WANT AIRCRAFT STEELS?

Our Chicago Warehouse is designated by the War Production Board as a warehouse to distribute the following Aircraft Steels:

WD-X-4130 SHEETS
Open Hearth, Pickled and Oiled to Spec. AN-QQ-S-685. All gauges .016 to .50, sheets 18" x 72".

NE-8630 SHEETS
Open Hearth, Pickled and Oiled to Spec. AN-S-12. All gauges .016 to .50, sheets 18" x 72".

STAINLESS SHEETS
Spec. AN-QQ-S-772.
Spec. AN-QQ-S-757.

STAINLESS STEEL BARS
Spec. AN-QQ-S-771.

These steels are for use in airplanes and available at our Chicago Warehouse only.

WELDING ELECTRODES—ALL TYPES
These are available through all our warehouses.

9 CONVENIENTLY LOCATED WAREHOUSES

CHICAGO (90),	1319 Wabansia Ave., P. O. Box MM	Teletype CG. 605	BRUnswick 2000
BALTIMORE (3),	Bush & Wicomico Sts., P. O. Box 2036	Teletype BA. 183	GILmore 3100
BOSTON (34),	176 Lincoln St., Allston, P. O. Box 42	Teletype BRTN. 10	STAdium 9400
CLEVELAND (14),	1394 E. 39th St.,	Teletype CV. 153	HEnderson 5750
MILWAUKEE (1),	4027 West Scott St., P. O. Box 2045	Teletype MI. 587	Mitchell 7500
NEWARK (1), N.J.,	Foot of Bessemer St., P. O. Box 479	Teletype NK. 74	Bigelow 3-5920
		REctor 2-6560 -	BErgen 3-1614
PITTSBURGH (12),	1281 Reedsdale St., N. S.	Teletype PG. 475	CEdar 7780
ST. LOUIS (3),	21st & Gratiot Sts., P. O. Box 27	Teletype SL. 384	MAin 5235
TWIN CITY,	2545 University Ave., St. Paul (4), Minn.	Teletype STP. 154	NEstor 2821

UNITED STATES STEEL SUPPLY COMPANY

USS STEELS SERVICE

UNITED STATES STEEL SUPPLY COMPANY

UNITED STATES STEEL

Your Post-War Plans Are Already Made

. . . When it comes to Humidifier Water Control

THE NEW
McDONNELL
Snap Action
FLOAT VALVE
ALSO AVAILABLE FOR PRESENT NEEDS CARRYING HIGH PREFERENCE RATING
No. 517, consisting of No. 417 Float Valve with rugged die cast float chamber and cover.
No. 417 Snap Action Float Valve for installation in humidifier pan or float chamber.

WE never started on a job that looked easier, or proved tougher, than the making of a dependable float valve for the humidifier pan of warm air furnaces.

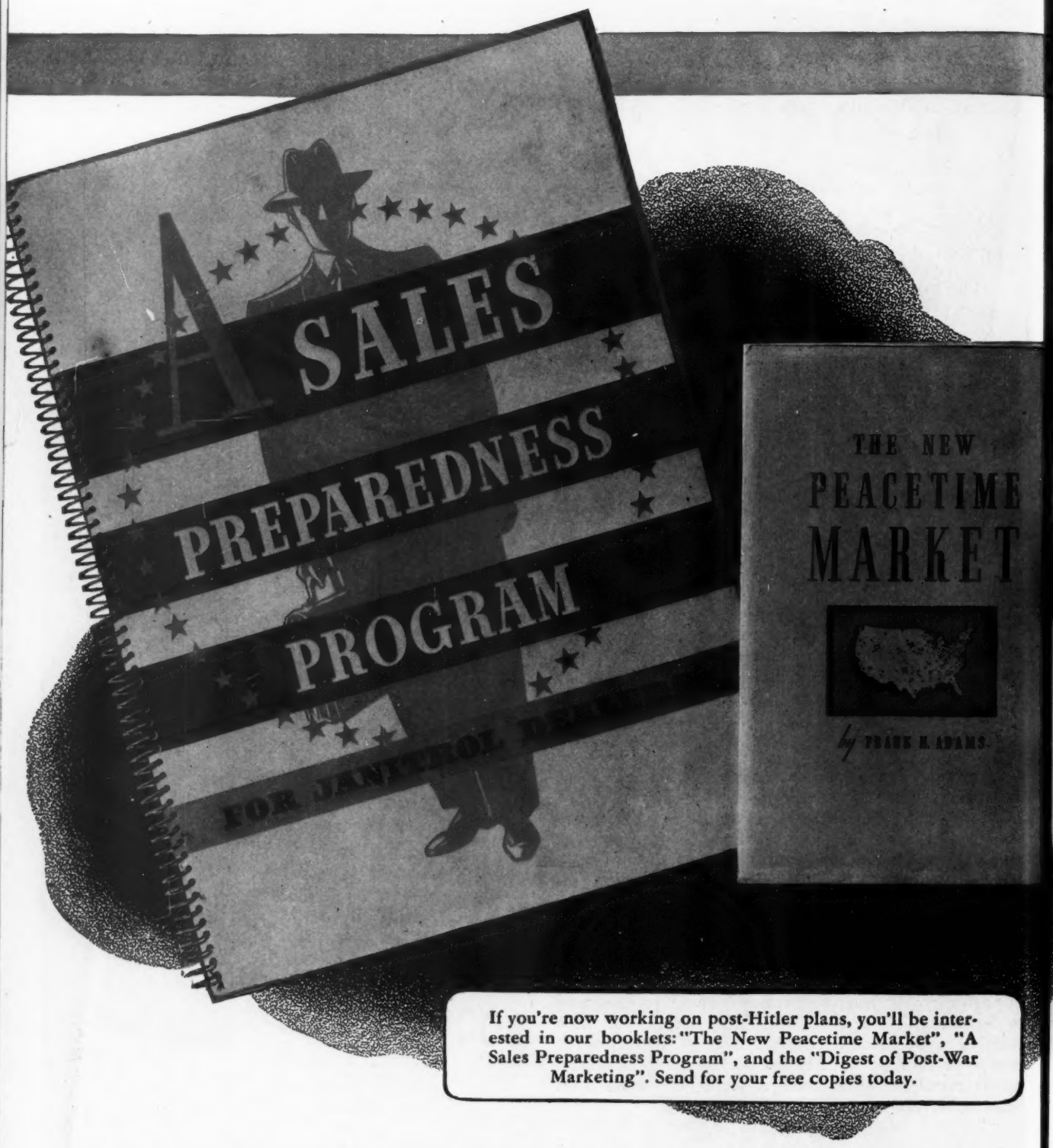
When we brought out the McDonnell Humidifier Water Control back in 1939, we thought we had the problem completely licked. As a matter of fact we *did* make a big improvement over the old type of float valve — the kind that slowly cracks open when the float drops and simply dribbles water into the pan. This seeping or dribbling action wasn't sufficient to keep the valve orifice clear and prevent lime or dirt from plugging up the valve. So the basic problem was to design a full-flow valve.

Our "snap action" valve accomplished this. It was designed to snap wide open whenever the float dropped a quarter-inch. The full stream sluiced out the orifice —kept the valve in good operating condition. But while it represented a big advance over the old way, we frankly admit that there was still room for improvement.

We like a tough problem of this kind; so we have sailed into it in dead earnest. The period when production was practically stopped proved an excellent opportunity for intensive research, field studies, and re-designing. As a result, the "snap action" has now been brought to a remarkable stage of perfection; a new type of float with better action has been developed; many fine-spun changes have been made that truly achieve a new standard.

McDONNELL & MILLER
1318 Wrigley Building, Chicago 11, Illinois
Doing One Thing Well

Start fast after Hitler g



If you're now working on post-Hitler plans, you'll be interested in our booklets: "The New Peacetime Market", "A Sales Preparedness Program", and the "Digest of Post-War Marketing". Send for your free copies today.

SURFACE COMBUSTION • TOLEDO 1, OHIO

Offices and Engineering Service in Principal Cities

gives up! *Your business depends on it!*

AFTER Germany surrenders and the European war is over, Japan undoubtedly will still have to be licked, but it looks like some men and materials will be released on the home front, and some government restrictions will come off.

In this period the replacement or modernization market will be the biggest in history.

Private building will be getting started again and should gradually rise to an all-time high.

The company that gets off to a quick start, lines up its prospects, sends out an emergency sales force and brings in the orders, will establish itself for the whole post-war period. Once the beach heads have been won, a big share of business will be assured.

We're not planning any dream furnaces for this post-Hitler period. We've got some ideas about furnaces of the future, but you can't take the gleam in a furnace designer's eye and install it without months of gruelling tests in laboratory and field.

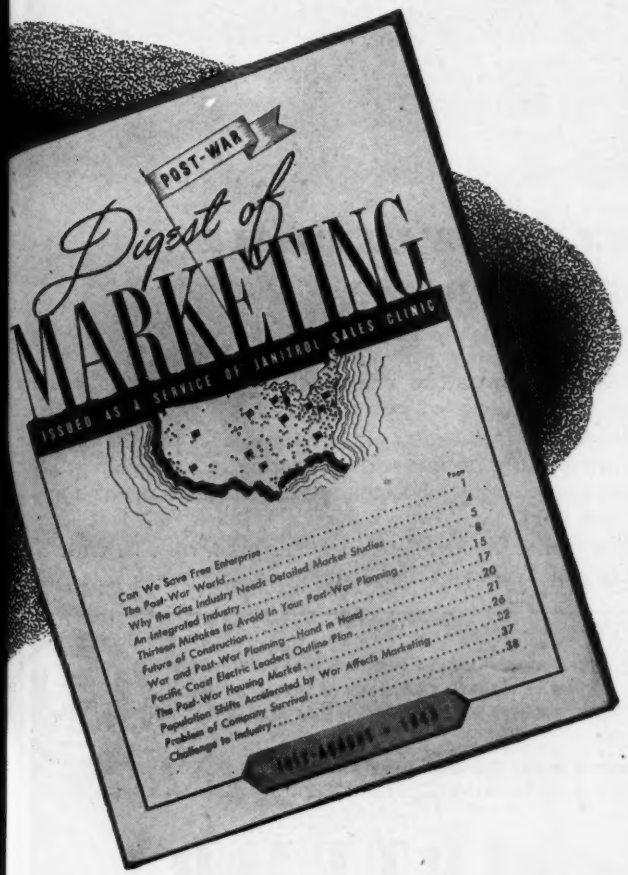
In this transitory war period we think you're going to want:

1. *Good Furnaces*—Furnaces you know something about and can recommend to your customers.
2. *Fast Delivery*—Because a lot of your sales are going to depend upon your ability to deliver the goods.

Therefore, about sixty days from the time materials are released we will be delivering JANITROLS. They will be small, compact, handsomely designed, fully automatic furnaces of several different types, and of proven efficiency. Introduced just prior to the war, thousands were installed and have now been tested by three years of hard service.

Are you going to take advantage of this post-Hitler period to build a stronger more profitable business? Are you going to take on well-known proven lines? Do you need help to get back into the selling of heating, help in rebuilding your organization, in sizing up the market, in finding and training men for an emergency task force?

We'll be glad to help you work out a "Quick-Getaway" plan to go into effect the day Hitler falls and to work with you on long-range post-war plans. We will do the best we can by mail or will have one of our Janitrol representatives sit down with you.


POST-WAR
Digest of
MARKETING
ISSUED AS A SERVICE OF JANITROL SALES CLINIC
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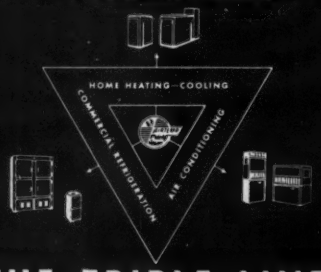
ALSO MAKERS OF INDUSTRIAL FURNACES AND KATHABAR HUMIDITY CONTROL SYSTEMS

JANITROL

GAS HEATING EQUIPMENT

OUTSIDE SELLING

With the Chrysler Airtemp line of postwar heating and cooling equipment . . . heating dealers will have an outstanding story to tell home owners. Handsome new products . . . compact, functional design . . . new principles of operation . . . greater fuel economies in heating . . . a new "luxury" in summer cooling . . . available at mass-production prices. That is why outside selling should prove highly profitable!



THE TRIPLE LINE

HOME OWNERS WILL WELCOME CHRYSLER AIRTEMP DEALERS

When Chrysler Airtemp dealers go to a prospect's home . . . they can feel pretty certain of a warm welcome. The public is eager to learn how to obtain greater indoor comfort . . . anxious to take advantage of the wonderful new heating systems . . . to enjoy, for the first time, the new comfort of summer cooling.

The new home and replacement markets will be tremendous. Fuel rationing has created a new appreciation of the importance of adequate, efficient heat in the home.

And Chrysler Airtemp's time-tested summer cooling unit . . . added to a forced warm air heating system . . . will bring a new year 'round comfort to even modest homes.

The combination of heating and cooling equipment offers heating dealers an opportunity for *12 months profitable operation.* Many will also want to handle the Chrysler Airtemp commercial refrigeration line . . . it opens up an entirely new source of income.

Direct dealer contracts will be available for just the Chrysler Airtemp heating line—or for heating in combination with air conditioning or commercial refrigeration—or for all three lines.

You can really *go after sales* and *get them* . . . with The Chrysler Airtemp Triple Line.

The Indoor Climate Institute is making the American Public Conscious of the Need for Greater Indoor Comfort and Health.

MEMBER I.C.I. INDOOR CLIMATE INSTITUTE

Next Month's Advertisement Will Be Devoted to the Subject of Installation.

BUY WAR BONDS

CHRYSLER AIRTEMP

AIRTEMP DIVISION OF CHRYSLER CORPORATION • DAYTON, OHIO

Tune in Major Bowes every Thursday, CBS., 9 p. m., E. W. T.

No matter

how you stretch it . . .

"THE COATING STICKS"

Weiralead

LEAD ALLOY COATED SHEET

Here is sheet steel of unusually high and uniform ductility—and a coating that flows with the steel. Weiralead is a new, improved hot dipped product extensively used in ammunition box liners, air cleaners, automobile radiator shells, mouldings, precipitron deposit plates, meter boxes, cabinet separators, lantern parts, radio condenser shells, can spouts, conductor pipe elbows, oil filters, and automobile and truck muffler shells. Weiralead—due to the particular composition of the coating affords better and more economical soldering. The weldability of this product makes possible difficult assemblies. Its remarkably malleable coating provides good die lubrication and is an excellent base for paint, lacquer or varnish. Write for your sample of Weiralead and complete details. It may be your answer to a tough drawing problem.

WEIRTON STEEL CO.

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA *Sales Offices in Principal Cities*

Division of NATIONAL STEEL CORPORATION *Executive Offices, Pittsburgh, Pa.*

Sound the Alert!

MANAGEMENT
•
LABOR

—for the 5th War Loan drive during June and July. The need for the 5th War Loan is immediate, crucial. For impending events may make the 5th the supreme financial effort of the war.

The U. S. Treasury has set the overall goal at $16,000,000,000 — $6,000,000,000 from individuals alone. This is the biggest sum ever asked of the American people—*and it must be raised.*

That's why the U. S. Treasury asks Management and Labor to sit down together and organize—NOW!

For organization—good organization—has been responsible for the excellent showing of the payroll market. And its most important single superiority has been personal solicitation—desk to desk, bench to bench, machine to machine personal solicitation. 71% of all persons on payroll deductions were solicited for the 4th War Loan.

Now, to personal solicitation, add the sales incentive of a definitely established plant quota. Build your campaign around a quota plan. Set up departmental goals. Stress percentage of participation figures. Stimulate group enthusiasm.

In planning your quota campaign, work in close cooperation with the Chairman of your War Finance Committee. Everything is set to make the 5th War Loan drive a huge success—with your help!

(Note: You've read this message. If it doesn't apply to you please see that it reaches the *one* person who can put it in action!)

Here's the Quota Plan:

1. Plant quotas are to be established on the basis of an *average* $100 *cash* (not maturity value) purchase per employee.
2. Regular Payroll Savings deductions made during the drive accounting period will be credited toward the plant quota.
3. 90% of the employees are expected to contribute toward raising the cash quota by buying extra 5th War Loan Bonds: 1—Outright by cash. 2—By extra installment deductions. 3—By extra installment deductions plus cash.

Example: **JOHN DOE Mfg. Co.** — 1,000 Employees

1,000 employees x $100 Regular Payroll deductions during the eight weekly payroll Accounting Periods of June and July = $100,000 Cash Quota

30,000
$70,000 (to be raised by sales of extra Bonds to at least 900 employees)

ORGANIZE • SOLICIT • DELIVER

The Treasury Department acknowledges with appreciation the publication of this message by

AMERICAN ARTISAN

★ ★ *This is an official U. S. Treasury advertisement—prepared under the auspices of Treasury Department and War Advertising Council.* ★ ★

NORTHWESTERN for REPAIR PARTS

THE heating season just closed has taken its toll of the furnaces in your community and it's up to you to put them back in top operating condition during the off-season months.

The manpower shortage is so acute that the necessity for repairing as early as possible is mandatory. Stocks will be more complete this summer than later and deliveries much better.

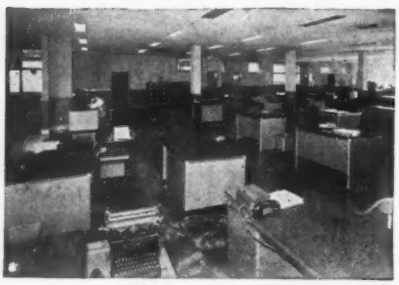
We suggest a drive be started to get the necessary repair work done at once.

Northwestern Stove Repair Co.
662 W. Roosevelt Road
Chicago

"QUIET"

ABSORB AIR-CONDITIONING NOISES with Careyduct ...THE ALL ASBESTOS ACOUSTICAL AND INSULATED DUCT

WCKY—Radio Studio, Cincinnati



Offices—Burkhart Mfg. Co., St. Louis

Finke Furniture Store, Evansville, Ind.

Kroger Grocery & Baking Co., Laboratories, Cincinnati

IN radio studios, hospitals, churches, theaters, hotels, offices, homes—wherever quiet working and living conditions are required—this all asbestos, prefabricated duct will eliminate noise from the air conveying system.

Careyduct is a development of the Carey Research Laboratory and scientific field testing. It is a natural sound absorber—a non-conductor of sound, and non-resonating. It "quiets" fan noises and cuts down speaking tube effects and eliminates "cracking" due to changes in air pressure. By effectively absorbing noises, it permits the use of smaller duct sizes with higher air velocities. This also solves difficult installation problems where space is limited.

Besides its absorption of noise, Careyduct has many other advantages over older and less efficient methods. It is *fireproof;* is quickly installed; absence of noise in erection (unavoidable in handling metals) permits installation in occupied buildings such as hospitals, stores, banks, etc.; conserves metals; neat and compact; can be painted to match walls and ceilings; costs no more, frequently less, than insulated metal duct.

For technical details and further information, send for "Careyduct Manual." Address Dept. 100.

THE PHILIP CAREY MFG. COMPANY

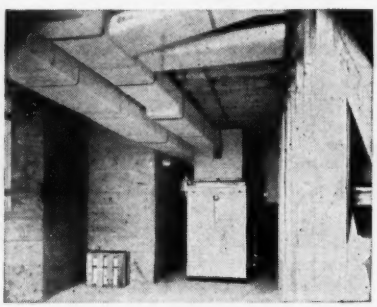
Dependable Products Since 1873—**LOCKLAND, CINCINNATI 15, OHIO**

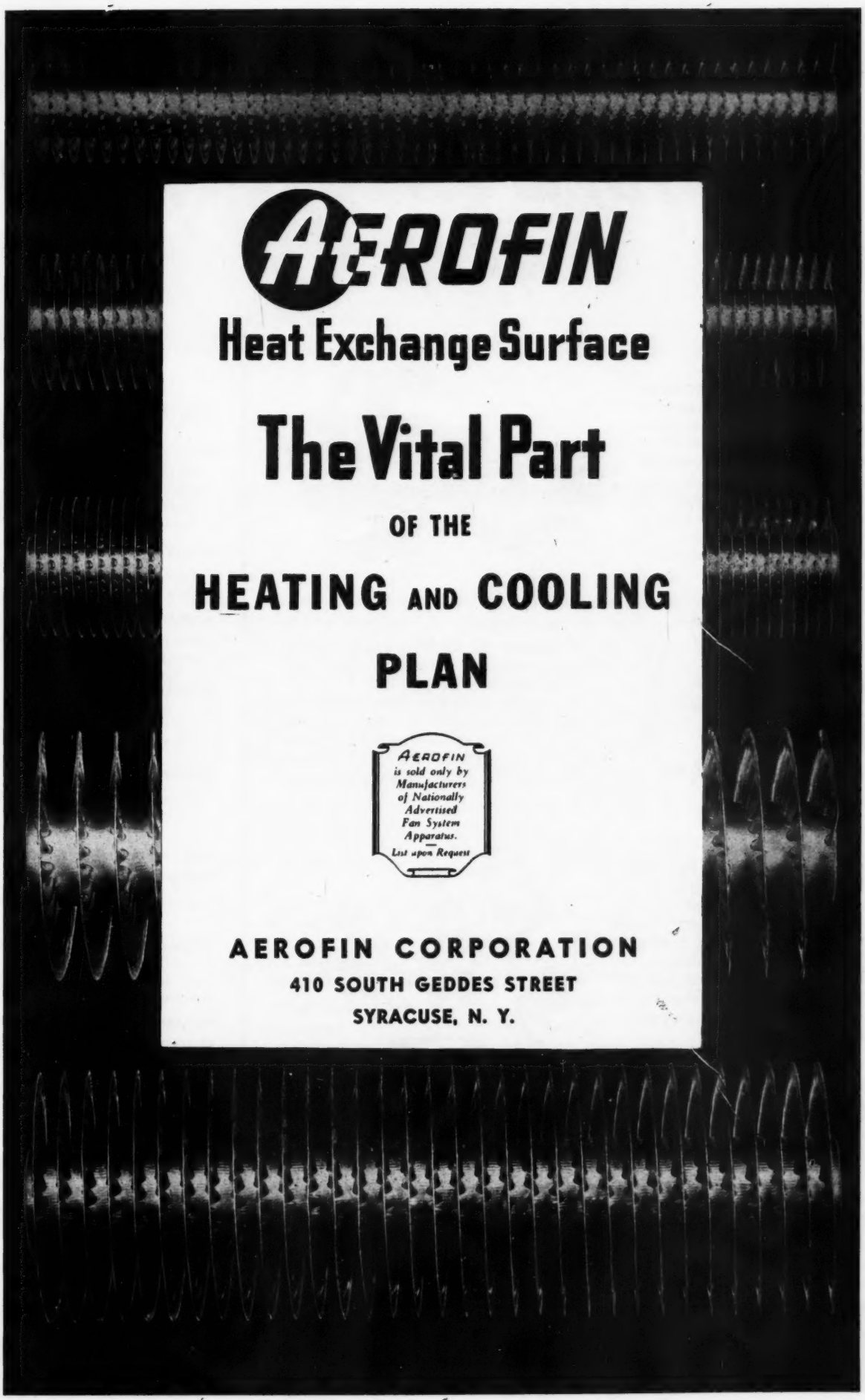
In Canada: The Philip Carey Company, Ltd., *Office and Factory:* Lennoxville, P. Q.

Children's Hospital, Cincinnati

Vocational and Industrial Training Schools include the art of handling Careyduct in their courses on sheet metal work.

Residence, Glendale, Ohio

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"QUIET"

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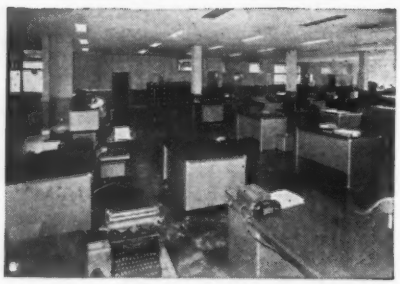

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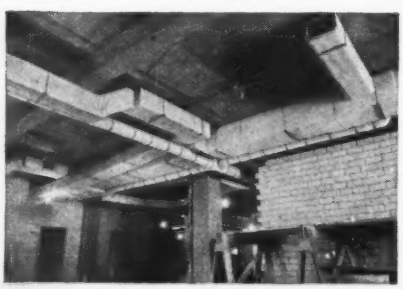

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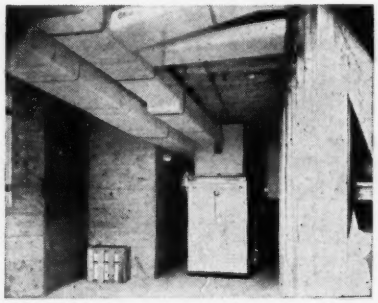

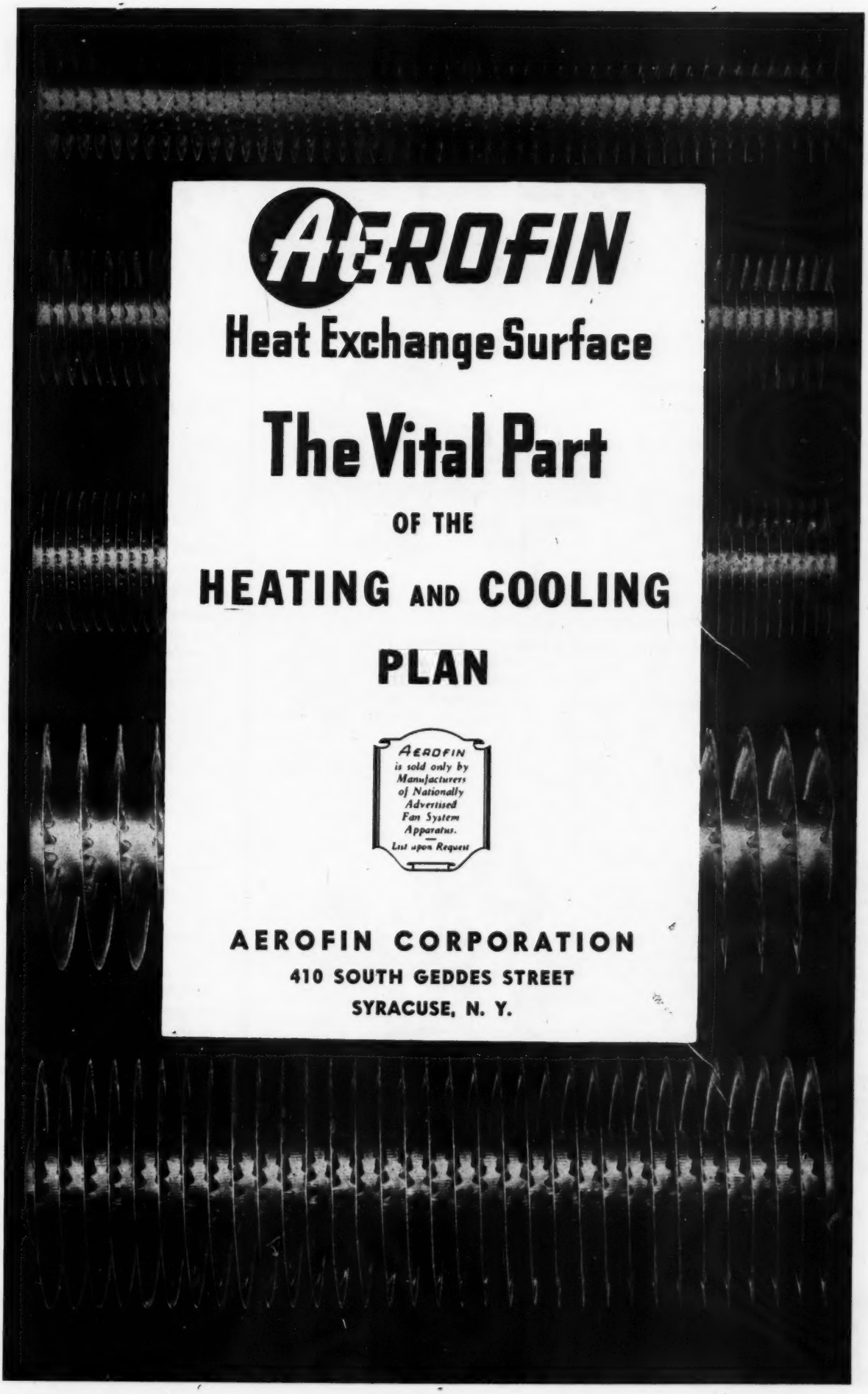
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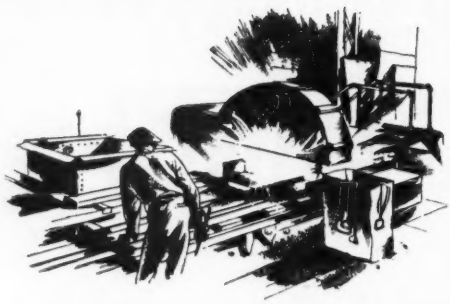
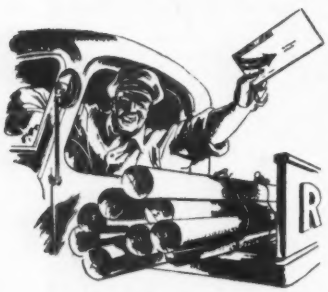
Can These Ryerson Skills Help You?

Steel Cut to Close Tolerance. Experienced crews manning high-speed friction saws, giant shears and other metal-working machinery quickly turn out steel—cut, formed or otherwise prepared to your requirements. Steel that is cut to exact specification eliminates scrap—frees man-hours for more production.



Any Shape Expertly Flame Cut. Skilled operators and modern equipment combine with ever-present Ryerson stocks to give accurate flame cutting—prompt delivery. Almost any shape no matter how intricate can be cut by flame. You save the expense of forging or casting and gain the added strength of rolled steel.

Metallurgical Help For Steel Problems. Ryerson engineers and metallurgists are experienced in serving customers in every branch of industry. They have a genius for solving problems pertaining to steel application, heat treating and fabrication and you can depend on them to work with you whenever a difficulty arises.



Speedy Delivery Without An Expediter. Every man and woman in our eleven strategically-located plants knows the meaning of the word *rush!* The Ryerson organization is geared to getting your steel delivered in the shortest possible time. Get in touch with your nearby Ryerson plant when you need steel.

STEEL IN STOCK FOR IMMEDIATE SHIPMENT

BARS

All types and sizes of carbon and alloy bars . . . Allegheny stainless, tool steel . . . hot rolled, cold finished, heat treated.

SHEETS

Allegheny stainless and more than 17 other types of sheets.

PLATES

A wide range of sizes and analyses prepared to your specifications.

STRUCTURALS

All standard sizes and shapes . . . cut to your order, punched, flame cut, or otherwise prepared.

TUBING

Both mechanical and boiler tubing in all standard sizes.

Strip Steel • Shafting • Reinforcing 4-Way Floor Plate • Bolts • Nuts Rivets • Etc.

Joseph T. Ryerson & Son, Inc. Plants:

CHICAGO.....16th & Rockwell Streets
MILWAUKEE.....320 So. 19th Street
ST. LOUIS.....5 Clinton Street
DETROIT.....1600 E. Euclid Avenue
CLEVELAND....E. 53rd & Lakeside Ave.
CINCINNATI..Front St. & Freeman Ave.
BUFFALO.....40 Stanley Street
BOSTON..3rd & Binney Sts., Cambridge
PITTSBURGH.....330 Grant Street
Plant: Carnegie, Pa.
PHILADELPHIA.....5200 Grays Avenue
JERSEY CITY.....203 Westside Avenue

RYERSON STEEL-SERVICE

You are the Key to the Fuel Conservation Program

TO THE warm air heating industry has been given the grave responsibility of putting and keeping seven million warm air furnaces in first class operating condition as our part in the national fuel conservation program which is now officially under way. The prime objective of this campaign is to create a basis of fuel savings that can overcome the estimated 38 million ton shortage of coal required this year.

This program, launched in Washington, by numerous Washington agencies, will emphasize "Prepare for Winter" by winterizing homes and buildings through such permanent improvements as heat controls, insulation, storm sash, weatherstripping—plus servicing the heating plant to insure maximum efficiency.

The campaign will issue officially through Office of War Information but the data to be used and the mechanics of the program will be carried on by such agencies as Office of Civilian Requirements, Plumbing and Heating Division and Fuel Conservation Division of WPB, Federal Housing Authority, and others.

In detail, Fuel Conservation Division has submitted data showing how much fuel may be conserved by various means at hand; Office of Civilian Requirements (also active in preparing data) will be the claimant agency to request materials needed to produce the equipment needed; Plumbing and Heating Division will distribute these obtained materials to manufacturers for production; Federal Housing Authority has already announced a summer loan program which will permit the owner to repair, replace, service his heating equipment on a long term loan with first payment next November. OWI will prepare all the advertising matter, booklets, newspaper publicity, dealer helps and other printed or written matter to be used in the campaign.

This all adds up to an impressive campaign—but no man and no agency, sitting behind a desk in Washington, can save fuel next winter by writing publicity; or by getting materials from our national stockpile to convert into equipment; or by making it easy for a home owner to finance service.

No—this program needs something more and that need is—the active support of every warm air heating dealer in the country.

Products, publicity, financing are all helpful—necessary of course—but until every dealer in his community does his share of selling, these controls, insulation, storm sash will lie in warehouse; financing will go unused; publicity will be only something to talk about over the supper table.

American Artisan believes this point is worth emphasizing. For example, suppose the control manufacturers produce in the third and fourth quarters (see report on Controls, page 45) 300,000 thermostat-limit control-damper motor sets—what useful purpose will these serve if they lie on the shelves of jobbers or in the dealers shop? These 300,000 sets can help save fuel only if the warm air heating dealer, installs his share of the sets on the furnaces in his community.

So—in the final analysis—a very large part of this fuel conservation program lies in the hands of the warm air furnace dealer. He is the key to the success or failure of this very necessary effort to help win the war. Our job is to sell and install controls and furnaces, blowers and filters; to repair and service existing heating plants including the furnace, the stoker, the oil burner, the blower, the filters, so that each plant operates with maximum efficiency.

American Artisan makes this suggestion—let each dealer determine how many sets of controls, how many furnaces, how many filters, how many blowers—how much insulation if he sells insulation—he can sell and install with the manpower and the supply of items available and then divide these into weekly or monthly quotas. Then, with these quotas as a goal, make a determined effort in each period to sell and install these quotas. If we do this we can help save fuel and help win the war.

What Is The Mid-Year Status of Heating Equipment?

ON several pages following, American Artisan presents a mid-year summary of the situation in furnaces, blowers, registers and grilles, warm air pipe and fittings, motors and controls.

This is, in a measure, a follow-up to the report published in the November and December, 1943 issues which forecast the expectation for 1944 in furnaces, but goes farther and includes other heating accessory items so essential to the continued functioning of this industry.

Each of the items has its own detailed study. Much of the information was gathered in Washington in March and April. A report was prepared for the May issue and submitted to concerned Washington agencies, but approval for publication was not obtained from some agencies because between April 1 and May 1 several important changes occurred. To bring this study up to date and to include these changes, the original report has been re-written; it is believed that so far as publication is permissible the following facts are authentic.

Briefly, the situations explained in detail following may be summarized as follows:

1—From numerous sources it now appears that for many materials used in the production of the items reported, there is now a growing national stockpile of materials. Some of the materials are so plentiful they are "running out of Washington's ears". Other materials are still scarce or are right on the teeter-totter—if the invasion goes well we will have plenty; if the invasion goes badly they will continue scarce or the supply may become acute.

2—It is the opinion of this publication that there is in many places in Washington a very definite fear that widespread release of materials without control may lead to public belief that the war is won with subsequent falling off in production and increased shifting of manpower. To stop any such situation, American Artisan believes we may see for some time a definite attempt to release materials in a niggardly fashion and a definite "hush-hush" attitude on the materials situation, thereby compelling every industry to dig intensively for materials. There is, also, a pretty carefully prepared program in Washington designed to prevent full production of certain civilian items which require large tonnages of materials and large numbers of workers (radios, refrigerators, automobiles are cases in point).

3—Definitely, the problem of what civilian products industries shall get materials and be given the "go ahead" signal is involved with reconversion. We all appreciate that reconversion hinges on the invasion—the timing is being worked out. We feel sure that reconversion will start sometime before the German war ends and will continue at an accelerated pace while we finish off Japan. Some civilian lines will be under close control until the end of both wars—the furnace industry should not be so classed—we may get approval for full production before the end of 1944.

To a considerable extent, types of items required for the finished civilian product will govern the release date. For instance, as shown in the report on motors, it looks as if motors will be "tight" for a long time to come; therefore any product needing motors will be late in getting complete release. On the other hand, items such as gravity furnaces, may be completely free soon and only manpower will restrict production.

4—Manpower is now and will be for some time, the chief difficulty. Plumbing and Heating Division, WPB summarizes the manpower situation like this: "A basic WPB policy is to authorize approval of resumption or increases in

production of civilian products only when such increases will not interfere with military programs and stipulates that such increases shall be placed in Group 3 or 4 labor areas. Portions of such increases may be put in Group 2 labor areas if it can be shown that it can be done without interference with military production. Approval here must be obtained from the appropriate Vice Chairman. Resumptions or expansions of production can be authorized for Group 1 labor areas only after clearance and approval by the Area Production Urgency Committee or the Executive Vice Chairman if there is no such committee. Finally, all these limitations shall not apply to plants whose total employment, after the proposed production increases have been effected, will not exceed 50 persons in Los Angeles, San Diego, San Francisco, Portland, Seattle and 100 persons elsewhere in the U. S."

5—It is becoming evident that one very urgent fear in Washington is that there will be a fuel shortage next winter. We should realize from recent happenings that the Fuel Conservation Division of WPB and the Fuel Conservation Council for War are powerful factors in all production program thinking; anything approved by these agencies has a "better-than-good" chance of getting materials and approval. A case in point is controls—we report the huge program now under way—this program is definitely pointed at saving fuel. Other items used in heating which can definitely be proven as saving fuel will do well to obtain the backing of these agencies.

6—The goal of the fuel conservation program, we hear, is 38 million tons of coal saved in the coming heating season. In this connection we call attention to the first three reports from contractors on service in this issue. Four other reports will follow. These reports show, conclusively, that warm air heating dealers are actually the key to the fuel conservation program. In effect, Washington is handing us (and will hand us later) furnaces, controls, and other necessary appurtenances and saying—"Take these products and save fuel". We, in turn, can save fuel only if we intensify our present program of putting every possible warm air furnace in the best possible condition and by adding thereto available items which help save fuel.

This is no mean assignment. It means:

A—We must spread 200,000 replacement furnaces over all necessary replacements.

B—We must take repair parts (which seem plentiful enough) and patch up several hundred thousand other furnaces so they can function through the next heating season.

C—We are expected to sell and install the greater portion of 290,000 barometric dampers, 40,000 limit controls, 300,000 damper regulator sets, so furnaces will use less fuel.

D—We must do this despite the fact (see AA report on Manpower, January, 1944 issue) that our dealers now have only half the number of service men we ordinarily employ and despite the fact that we need two and one-half times as many service men as we now have if we are to keep pace with the increasing number of furnaces which need servicing because they are growing older and cannot be replaced.

So far as American Artisan can tell now (June 1) we do have enough repair parts to do the job assigned us—what we may expect in numbers of some heating items during the remainder of 1944 and for some other items into the first months of 1945 is explained in reports following.

Here are The Facts on— Furnaces; Controls; Blowers; Motors; Registers and Faces; Warm Air Pipe and Fittings

IN THE October, 1943 issue AMERICAN ARTISAN forecast the production in 1944, of 200,000 furnaces for replacement purposes plus 60,000 furnaces for new war housing.

In following issues AMERICAN ARTISAN suggested a plan for the equitable distribution of these 200,000 replacement furnaces based upon furnaces in use by counties and emphasized that only if every manufacturer, jobber and dealer cooperated patriotically could we hope to spread these 200,000 replacement furnaces fairly so that no home owner would go without heat and so that every dealer might have furnaces for replacement when the old furnace could not be repaired.

In April, at the end of the first quarter, a check was made in Washington to determine if production was actually keeping pace with the October forecast. In May, when the Census Bureau released its report on furnace "orders booked" for the first quarter, there appeared a serious decrease from expectations (and hopes) so much so, in fact, that a further check was begun so that we could, in this June issue, furnish the industry a report of the situation at the mid-year.

The situation is not clear cut and definite—we will, therefore, publish certain known facts; we will project from these; we will also report other divergent facts; we will report our own conclusions.

Production figures for the first quarter of 1944 can be cited. Plumbing and Heating Division of WPB, speaking through Morgan Johnston at the June meeting of the N.W.A.H.&A.C. Ass'n reported as follows:

"During the first quarter of 1944, 74,000 furnaces were produced, of which 65,000 were shipped. If the same rate of production continues throughout a year's period, a total of 296,000 furnaces will be produced for all military, housing and civilian uses. The production of oil and gas furnaces is low, but substantial numbers are being made available for those users who have requirements for them. Considering that solid fuel furnace production, which represents the only real demand today totalled 65,000 units during the first quarter, the industry is operating at about 80 per cent of the base year 1940. There isn't any appreciable inventory of solid fuel burning furnaces. A few scattered stocks may exist, but they are heavily off-set by unfilled orders *which number slightly in excess of 60,000 furnaces.* Those unfilled orders do not necessarily reflect essential need, but are mixed public demand."

We repeat again—the above quotation is from Plumbing and Heating Division.

AMERICAN ARTISAN feels that this may not prove to be the true picture because—

1—In the first quarter report we believe there are some 20,000 small furnaces carried over from 1943, but reported as produced. If this is so, then production was not 74,000 but 54,000 furnaces of all types.

2—Production for January (not official figures) was about 26,000 furnaces of all sizes and types, for all purposes. February was about 25,000 furnaces; March was about 25,000 furnaces. These were reported production and included for the quarter the 20,000 carry-over.

3—Statements from only a half dozen larger manufacturers makes AMERICAN ARTISAN believe that April production may show a decrease of some 2,000 furnaces below March and May may show a still further decrease of 2,000 furnaces below April.

4—If number 3 above proves correct, it indicates that production is falling off because of manpower problems and may continue to fall throughout the remainder of the year.

5—AMERICAN ARTISAN, therefore, feels that there is grave possibility that this industry will not produce as many furnaces in 1944 as we produced in 1943. According to Plumbing and Heating Division, compiled from an eleven months report by industry with one month estimated, there were 198,000 furnaces of all kinds produced in 1943. We may have, then, not more than 200,000 and perhaps fewer produced in 1944.

6—From this possible 1944 total production we must subtract the requirements for new housing which, as compiled by the National Housing Agency, will be approximately 55,000 furnaces of all sizes and types.

7—Subtracting 55,000 furnaces required for new housing from the total of 200,000 furnaces leaves 145,000 furnaces for replacement purposes in 1944.

AMERICAN ARTISAN emphasizes, again, that this summary is only partly official, based upon actual records and is, in part, an opinion, but perhaps is worth keeping in mind because if this opinion proves accurate, warm air dealers who are using AA's suggested county quotas to determine how many replacement furnaces to expect should begin to revise their earlier determinations and repair more furnaces.

This summary on the furnace situation will not be complete without some report of the situation in gas furnaces which has recently developed. This situation is:

Gas Furnaces

The Manufactured Gas Division, Office of War Utilities, War Production Board, instigated a survey to determine whether or not certain gas utilities could take additional house heating load on their lines without requiring any major changes or additions to facilities. The survey disclosed that approximately 150 companies supplying manufactured gas have summer sendouts in excess of winter and therefore can take additional gas heating load. These 150 companies now serve approximately 500,000 gas users. The same survey disclosed that other cities with approximately 4,000,000 users can take some additional heating load,

but the procedure in accepting the load is somewhat different.

The situation can be described as follows: The 155 companies first mentioned have now received from Manufactured Gas Division, Office of War Utilities, blanket approval to accept heating load without making any individual or direct application to WPB. The other towns in the survey (with the 4,000,000 users) may make application on Form WPB 3138 for the sale of gas to new gas users and in the last three months many of these applications have been approved by WPB.

Generally speaking, there are several reasons for making the application—for example, perhaps the installation of a new gas furnace may require less material than the installation of a new other-fuel fired furnace; gas may be a by-product; hardship and sickness, including inability of the home owner to fire a furnace, may be a justification for granting the application.

The list of cities is not for publication, due to change from time to time, but any manufacturer, jobber or dealer, who has gas furnaces for sale and is prevented from installing these furnaces, can inquire of his local gas utility whether or not the utility is one of the utilities granted permission to install additional heating load with or without individual application.

If the local utility can not accept additional gas heating load, the holder of the gas furnaces may contact other manufactured gas utilities and find out where there are areas in which gas furnaces can be installed. The various gas utilities excepted by the order have been advised by the Office of War Utilities whether or not they can accept additional load and it is therefore up to the utilities to determine whether or not they wish to make additional heating load.

Gas Conversion Burners

Certain agencies in WPB are engaged at present in preparing the ground work to change Order M-126 to take the production of gas conversion burners out from under M-126 and include the production and sale of gas conversion burners in some order like L-79.

If the above brief explanation has not completely clarified the situation, readers are invited to write to the editors for the names of individuals and agencies concerned in this proposal.

AFTER months of uncertainty, during which the heating industry was promised a substantial quantity of control equipment with which we could do a real job of fuel saving, a definite program for control equipment is officially announced. ARTISAN readers will recall our hope for more control equipment last November when a program was announced but was not carried through, and our further disappointment in January when an announced control program turned out to be mostly barometric dampers.

Following is the official announcement of the control program:

"As part of the fuel conservation program for the 1944-45 heating season, the War Production Board announced May 29 that controlled materials *have been made available* for production of heating system controls for use in some 950,000 residential, commercial, institutional and industrial heating plants. Installers of the equipment will be able to purchase the controls freely.

"The control equipment for private dwellings proposed under this program consists of thermostatic regulator sets for coal hand-fired heating equipment, limit controls for installation on coal, oil or gas fired equipment already provided with some thermostatic control, and barometric dampers for use with oil and stoker-fired units. Each thermostatic regulator set consists of three instruments—thermostat, high limit control, and an electric damper operator.

"For commercial, institutional, and industrial buildings such as schools, hotels, apartments and small factories, three types of control systems are included in the program:

"1. An indoor-outdoor thermostat (a controlling device that governs the flow of heat to a structure and is affected primarily by outside weather conditions) with the necessary accessories for direct control of heat generation.

"2. A system consisting of an indoor-outdoor thermostat and an electrically actuated operator.

"3. Zone control sets for use on large buildings where sectionalized or zone control is necessary because of the varying heat losses of the several areas of the structures.

"The approved program calls for production during the third and fourth quarter of 1944 of the following products in the quantities listed:

	Third Quarter	*Fourth Quarter*
Limit controls	23,700	18,000
Barometric regulators	200,000	80,000
Thermostatic regulator sets	175,000	127,000
Indoor-outdoor thermostats	11,228	6,747
Indoor thermostats	3,583	2,154
Operators	1,433	862
Valves (electric)	2,866	1,723
Valves (pneumatic)	2,389	1,435
Commercial barometrics	12,500	7,000
Sets consisting of pressure controller and light duty operator	5,000	2,800
Sets consisting of pressure controller and heavy duty operator	5,000	2,800
Sets consisting of over-fire draft controller and heavy duty operator	5,000	2,800
Pumps	1,000	1,000

Steam accessories	25,000	25,000
Hot water accessories.....	25,000	25,000

"For production of this equipment the following controlled materials have been allocated for the third quarter of 1944:

1,510 short tons of carbon steel (including castings)
130 short tons of alloy steel (including castings)
116,000 lbs. copper-base alloy—sheet and strip
192,000 lbs. copper-base alloy—rod, bar and wire
3,000 lbs. copper-base alloy—tubing and pipe
25,000 lbs. copper base mill products
76,000 lbs. copper wire mill products
113,000 lbs. copper and copper base foundry products
2,000 lbs. aluminum products (unclassified)

"Advance allotments for the fourth quarter of 1944 will be issued in amounts not to exceed 75 per cent of the quantities authorized for the third quarter.

"Authorizations to individual manufacturers to produce the equipment will be made only if production in the plant in question, or labor requirements therefor, will not interfere with war production.

"Manufacturers desiring to produce any specified number of the above types of equipment should immediately file a separate CMP-48 application for the necessary material.

"The controls which will be made available under this program are intended for installation primarily on furnaces and boilers for fuel conservation purposes. However, adequate maintenance and repair items will also be available for fall distribution for use in conjunction with the items made available for the conservation program, since sufficient material has already been programmed for this purpose. Such items as radiator air valves, hot water valves, and radiator traps are included among the repair and maintenance items permitted."

From the Fuel Conservation Council for War, Automatic Controls Industry, the group which did so much to set up the original needs of the heating industry comes some additional explanation of the list and quantities shown above. The Council says:

"In the list of materials and items made available for production during the third and fourth quarter the first item is 'Limit Controls.' It is contemplated that these will be used in connection with existing heating facilities, principally on the older installations of stoker, oil and gas-fired equipment and particularly the first two. It is estimated that there are a great number of jobs, particularly stoker and oil, that are not equipped with limit controls, and the use of limit controls on those jobs will effect very appreciable fuel savings.

"The 200,000 barometric regulators for the third quarter and 80,000 for the fourth quarter are the domestic size and are in addition to the allotment made previously.

"The thermostatic regulator sets consist of a thermostat and limit control and a damper motor for use on domestic coal hand-fired heating plants. It is contemplated, however, that a number of these sets will be sold for small commercial buildings and apartment houses such as two- or three-family buildings, small stores, and so forth.

"The indoor-outdoor thermostats are such types as Minneapolis-Honeywell Weatherstat, the Marsh Tritrol, and the Raymond Duostat. While it is impossible to accurately estimate, it is assumed that probably 4,000 or 5,000 of them will be sold in connection with a motorized steam valve and the balance of them as direct control of an automatic heating plant. Several companies manufacturing this equipment have reported great success in directly controlling the heating plant from such a device, particularly on small and medium sized commercial and industrial structures.

"Valves, both electric and pneumatic, are motorized valves for use in zone heating in larger buildings.

"Commercial barometrics are the smaller sizes for use on heating plants in small commercial and industrial buildings. It is thought that most of these will not run larger than the 16-inch size.

"The pumps, steam accessories and hot water accessories were tied on the control program by the Office of Civilian Requirements and is not a part of the program proposed by the Fuel Conservation Council. They are valuable additions to the program, however, since their use will cure improperly functioning devices in the heating system and thereby increase the total conservation of fuel."

GENERALLY speaking, our industry seems to have gotten along pretty well on the quantities of prefabricated smoke pipe, elbows and warm air pipe and fittings provided in 1943 and so far in 1944. This statement seems to be substantiated by manufacturers, by the industry advisory committee and by jobbers and contractors. Rarely, in 1943, did reports reach this publication stating that dealers' jobs were delayed because of delays in obtaining pipe and fittings.

There are probably two reasons for this situation. First—all these products can be fabricated by the installer if he cannot find prefabricated so, if a pinch developed, the installer quite likely took sheets and "rolled his own."

Second—in 1943 the quantities of materials passed on to the manufacturers of pipe and fittings by Plumbing and Heating Division of WPB were promptly turned into finished goods and were fairly well in line with demands.

In the first quarter of 1944 the quantity of materials distributed to manufacturers by Plumbing and Heating Division were as large and in some cases larger than in 1943. Likewise, the quantities in the second quarter were equal to the first quarter.

For the third and fourth quarters of 1944 the original quantities of materials equalled first and second quarters, but in the last few weeks a cutback order

was sent out so that, at the present moment, our expectations for the third and fourth quarters are below first and second quarter production. These materials may be restored after the invasion gets under way.

To summarize—so far in 1944 we have been given as much or more smoke pipe and elbows, warm air pipe and fittings (in total) as we received in 1943. Between now and the end of 1944 we may get less; we may get as much; we might possibly get more than in 1943.

Our concern comes from the fact that in the approaching third and fourth quarters we anticipate our biggest demand. We should like to feel that we will have at least as much material as in 1943—if we get a drastic reduction we will have to do more shop fabrication and this is a serious problem for many installers because of the acute shortage of manpower.

The final solution to the problem of the material itself has not been finally settled, so far as we can determine. In peace times a very appreciable percentage of all warm air pipe and fittings was made of tin—both single and double wall pipe. Tin, of course, went out with the war. In 1943 there was a period of several months when manufacturers offered only 30-gauge black iron pipe and fittings. Then galvanized became more plentiful so at the end of 1943 and so far in 1944 the material usually offered has been 30-gauge galvanized iron.

Roughly, the cost of 30-gauge galvanized iron warm air pipe and fittings has been about two cents per section higher than the cost of tin—prewar. The galvanized iron has proved quite acceptable and is largely installed without paper which compensates, in part, for the two cents higher cost. Some manufacturers and some jobbers likely will prefer galvanized iron after the war because galvanized will mean one stock of all pipe and fittings—only time will tell the outcome.

How Materials Are "Claimed"

Since all new war housing is supposed to use substitute materials for warm air pipe and fittings, excepting runs within six feet of the furnace, National Housing Agency, as a claimant agency, has requested only a very small amount of material. The large use of warm air pipe and fittings is for replacement, repair and maintenance and, therefore, the claimant agency is Office of Civilian Requirements. The need for material for smoke pipe, warm air pipe and fittings, has been constantly under scrutiny in OCR because of the very great need for this material. Accordingly, OCR has perhaps given more attention to warm air pipe and fittings materials supply than it has to some other item of the warm air heating industry.

OCR does not claim material under the same classifications as the industry ordinarily designates items produced. For instance, in March, OCR reported a claim of 18,000 tons of galvanized iron for round pipe and fittings; also 9,750 tons for prefabricated ducts and fittings. OCR claimed 42,000 tons of materials for blue smoke pipe and fittings and 1,250 tons for registers and grilles.

This quantity of material is tentatively scheduled for each of the second, third and fourth quarters but, as stated, cut backs have already occurred.

It was reported during the fourth quarter of 1943 and the first quarter of 1944 that several producers of warm air pipe and fittings were not given enough material to keep their facilities busy. These manufacturers appealed for more materials; some manufacturers have obtained materials on such appeals; other manufacturers have had their appeals denied. Since most of this warm air pipe and fittings has been galvanized iron, there has been almost no materials in excess inventory or in redistribution available to manufacturers.

WHEN data for this series of studies were being gathered in Washington, the furnace blower situation was most confused. P-84 had been revoked; L-280 was about to be revoked; blowers were about to be put under L-123, which was a new order.

Now the situation has been changed again—for effective April 25 order L-79 was amended and among other items of plumbing and heating equipment are "furnace fans." Under L-79 a blower manufacturer may sell a jobber and a jobber may sell a dealer a "furnace fan 16-inch diameter or under, less motor" on an automatic AA-3 rating which the dealer or jobber originates.

But note that furnace fans under L-79 are shipped without motor.

According to one WPB ruling, a "furnace fan" means either a propeller type fan or a centrifugal type blower—in either case 16 inches in diameter or under, but only the rotor and scroll—no housing, no motor, but another ruling permits a "packaged" blower.

L-79 does not assign any preference rating to consumers, but deliveries to consumers for replacement and repair do not have to be on rated orders. This means that if Mrs. Jones has a blower (16 inches or smaller) which needs replacing, you may replace (using her old motor) simply by having Mrs. Jones certify as follows:

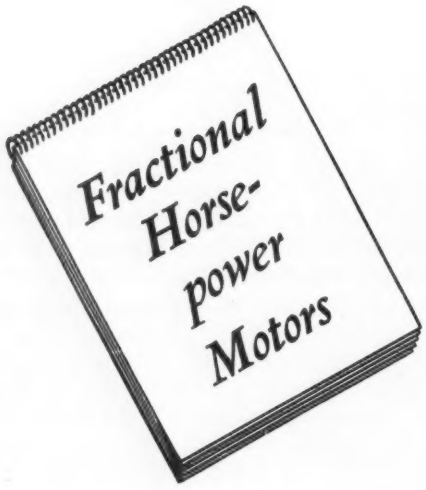
"I need the item included in this purchase to replace equipment worn out, damaged beyond repair, or destroyed. I will not use it to replace usable equipment or to make a substitution which would provide more extensive facilities than are necessary to replace the parts which are worn out, damaged, or destroyed.
Address of installation.....
Consumers' Signature .....
Address .....
"

If Mrs. Jones has a gravity furnace and wishes a blower for fuel saving, or better heating or a hardship case, she may apply to the nearest WPB office on form

1319 (Order L-79) if the total cost of installation is to be under $200. If WPB approves, she will get an AA-3 rating. She does *not get a motor*, so the dealer must supply the motor from his stock or a used motor. If the cost is over $200, Mrs. Jones applies to the local FHA office on form WPB-2896 (Order L-41), and if approved gets an AA-5 rating. This rating can also be extended for the motor.

For installation on a gravity furnace, where a new motor is required, Mrs. Jones applies to the local WPB office on form WPB-541 (Order L-123) and if approved gets an AA-5 rating for both blower and motor. Total installation cost must be under $200. If over $200 see WPB-2896 above.

Factories, stores, shops can get blowers with motors without priority assistance by extending their AA-5, MRO rating under CMP-5. Owners may buy blowers, with motors, for houses *occupied by tenants* by using AA-5, MRO under CMP-5.



L-79 AMENDED, permits the shipment of blowers (called "furnace fans") for repair purposes, but does not permit the delivery of fractional horsepower motors with the fans. In answer to the question "why no motors" Washington has stated that the reason lies in the scarcity of motors. Therefore a review of the motor situation may be of interest to the industry. Following is an analysis of the motor situation as outlined by General Industrial Equipment Section of WPB:

"Military demands for fractional motors, since the middle of 1943, have absorbed the great bulk of production. This situation continues this year despite the fact that production is five times prewar levels. In 1943 Army, Navy, Maritime Commission accounted for some 90 per cent of all output. What was left for essential civilian use was mostly AC motors, but was still short of demand. This continues in 1944.

"It should be understood that in the motor program there are many sizes and types of motors. Most combat types of motors are not tight. This is because demand has been decreasing and deliveries have kept ahead of net new orders. Ground Army, Navy and Maritime requirements take up about one-third of this group. Two-thirds are aircraft auxiliary equipment—selsyns, amplidynes, dynamotors — and fractional horsepower aircraft motors.

"However, fractional aircraft motors are somewhat tighter. Shipments in 1943 accounted for 20 per cent of the total and was met but the proportion is expected to increase in 1944. Shipments must increase to meet requirements of newer type planes. The new Super Fortress uses about 300 motors. Liberators and Fortresses use about 100 motors. Most of these aircraft fractionals use specially designed motors. They must be light and powerful—built of aluminum, magnesium and other alloys.

"At the present time, the backlog of fractional aircraft motors is about ten months. For the most part, shifts in the industry can supply the added manpower required for the growing aircraft motor program, but not much help can come from workers released from other industries because motor production requires special skills and wage rates are generally below those of other munitions industries.

"The worst situation exists in alternating current motors. In 1943 AC motors accounted for 13 per cent of total shipments and 90 per cent of the shortages. About 30 per cent of this type goes to the armed forces and 70 per cent to civilian programs. Most of the orders from the armed forces were met.

"Many civilian programs are having a tough time. Some civilian programs (farm machinery, for example) have high enough priority ratings (AA-2) to get a fair number of motors. But other civilian programs have only AA-3 or lower ratings and can get motors only after higher rated civilian programs are satisfied. Only programs rated higher than AA-3 can hope to get prompt shipments.

"While shipments of fractionals have risen steadily, new orders have been coming in even faster so that today the backlog has increased from six months at the beginning of 1943 to nine months today. If manpower can be maintained or raised slightly there is reason to believe that military requirements will be met, but civilian fractionals will continue to be tight. Perhaps better scheduling or increased efficiency may ease the pinch."

(Editorial Note—As stated above, the farm program is getting motors because the farm group early established the essentiality of their need and got an AA-2 rating. Other civilian groups—and the warm air heating industry is one of these—which did not established their essentiality are finding it difficult to get a program approved. It should be understood that CMP Products Group No. 401 which controls motor production has nothing to do with getting programs approved. Group No. 401 simply takes the materials approved for a given program and gets the motors produced. Therefore, so far as Group No. 401 is concerned the program with the highest priority rating gets motors first. If the warm air heating industry wants motors for blowers, we must set up a program and get it approved. Approval of the program will carry an allocation of materials and a rating. With materials and a rating we will be placed in the motor production schedule and in an improved position to get motors. Office of Civilian Requirements for replacement motors and perhaps Fuel Conservation Program for new blowers and motors to be installed on existing gravity systems as a fuel conservation device seem to be our two best bets at the moment.)

IN 1943 contractors around the country reported that in some cases it was rather difficult to obtain registers and return air faces for old house work. Contractors doing war housing did not report quite so widespread a scarcity, they, seemingly, having been able to obtain the necessary registers and faces by accepting assorted sizes or waiting for delivery.

The underlying causes of the situation probably can be explained as follows—for registers and faces used in new house construction, National Housing Agency has filed, as a claimant agency, an application for approximately 330 tons of steel to be used in the second quarter of 1944 for registers and faces, approximately 220 tons of steel for the third quarter and approximately 210 tons for the fourth quarter of 1944. These materials tentatively have been granted by the program committee and, according to NHA, should be sufficient to satisfy all new housing construction.

Faces for Replacement

For registers and faces to be used as repair and replacement, the situation is not so simple. First of all during 1943 and prior to that date, Office of Civilian Requirements assumed that there were no registers and faces required for repair and replacement —in other words, registers and faces just did not wear out. However, this attitude has changed and during 1944 OCR has determined that our industry likely will need for the whole year of 1944 approximately 400,000 steel cold air faces and 800,000 warm air registers. This is calculated on the basis of requiring at least two new cold air faces on each repair job. Mostly, this is for cold air faces to replace wooden faces which have been broken.

The figures may be open to some argument, but are not too bad for our purpose because if we assume that the industry gets 200,000 furnaces for replacement purposes in 1944, two cold air faces on each such replacement furnace would be 400,000 cold air faces or the figure quoted above. 800,000 warm air registers for replacement on 200,000 replacement furnaces is four warm air registers for each replacement furnace and this figure would be hard to criticize one way or another. If a replacement furnace goes in a house where the warm air registers are inefficient, and have almost no free area, then the same house should have a completely new set of warm air registers, not just one or two or four. Also, frequently the valve mechanism in registers breaks down, necessitating replacement. Also, many lightweight registers break down under wear and tear. Broken cast iron registers of old vintage are not uncommon and should be replaced for safety's sake as well as for fuel conservation. How many houses there are which should have a new complete set of warm air registers can not be determined. It must be remembered that large quantities of registers are required in connection with remodeling stores into living quarters, changing single family houses into two family apartments, installing additional runs, etc.

It would seem, then, that Office of Civilian Requirements is asking for material for new cold air faces, and warm air registers to be used for replacement purposes fairly well in line with the requirements of our industry as we have set them up.

May Be More This Year

During 1943 and the first quarter of 1944, register manufacturers have as a general rule applied for materials to be made into registers and faces on their CMP Application forms and, these applications were cut back considerably in the actual allocation of materials granted. The materials actually granted in 1943 did not come any where near supplying the number of cold air faces and warm air registers mentioned as a possibility for 1944. To this extent, registers and faces should be more plentiful this year than they were last year.

Manufacturers with these cutback allocations, as a general rule, filed appeals under Order M-126, asking for more materials to be made into registers and faces. The administrator of M-126 declares that, as a general rule, these appeals for additional material have been allowed so far in 1944 and will be allowed so that with the quantities of materials listed above, plus additional materials to be obtained by special application under M-126, the supply of registers and faces in 1944 should be sufficient for our purposes.

Labor Shortages a Handicap

But manufacturers of registers and faces are also up against the proposition of labor shortages and operation in critical labor areas and, as a result, scheduling of registers and faces for production has, up to now, been rather haphazard. Most register manufacturers are carrying a very heavy schedule of war production so that registers and faces for warm air heating systems must either be worked into the war production schedule or must be supplied out of manpower and facilities which are not currently being used for war production. Therefore, since there does not seem to be much prospect for improvement in this situation, contractors and jobbers requiring registers and faces might find it advantageous to place their orders for registers and faces as early as possible, and, as a further help, keep the sizes and finishes to the very minimum variety.

Register manufacturers are doing the best they can by using materials permitted under Order M-126 (top cut or Bessemer steel) and also by using excess inventory or surplus supplies of steel which does not come from some mill schedule.

Now is the time to

Modernize Your Accounting System

By Arthur Roberts

YEARS ago, a clipboard or spindle was the prevailing accounting medium; recordings pertaining to business transactions were impaled on a desk spindle or clipped to a board on the wall. Then came single-entry bookkeeping, one page for income, another for outgo. Charge sales were listed on separate pages. Eventually came the double-entry system wherein every entry had an offsetting debit or credit, assuring greater accuracy of recordings.

Many contractors and dealers use double-entry bookkeeping today and although it is far ahead of the old spindle system, nevertheless it trails modern accounting practice because double-entry routine has been streamlined to a considerable degree during the past few years in order to eliminate many dual recordings and to simplify the work so that the average businessman can utilize debit and credit technique with less time and expense.

Everybody Benefits by Good Accounting

Contractors, large and small, will benefit by modernizing their accounting methods, the big fellow by reducing his clerical expense; the little fellow by enabling him to do his own bookkeeping or audit and analyze the figures recorded by others. Our experience shows that most large contractors have fairly adequate systems. It is among the small and moderately sized contractors that we find a pronounced absence of good recordings. We estimate that more than 70 per cent of the smaller contractors do not maintain accounting records that meet requirements for truly effective and intelligent management. Our field studies indicate that this is largely due to the fact that the small contractor spends so much time in the shop or on his jobs that he has little time left for bookkeeping. He assumes that shop supervision provides a more direct control over operations because he can "keep his eye on things" to assure value received from his expenditures, but he doesn't realize that business operates like a machine with numerous parts. All parts must coordinate properly to get over-all efficiency, and the contractor cannot get a good perspective of over-all efficiency unless he fingerprints all operations by means of an adequate accounting system.

For this reason, many contractors have need for a modern double-entry system that meets two basic requirements:

1. Records from which information can be readily obtained for the future control and guidance of current operations.

2. A system requiring a minimum of clerical effort and which eliminates a large part of the details necessary when the accounting is handled on the double-entry plan.

Accounting has been streamlined during the past few years, the same as automobiles, heating equipment and furniture. At one time the contractor was satisfied with a financial statement at the end of the year. This statement told how business had fared during the year, but it disclosed little about the "why" of results or in what months money had been earned or lost. Business now moves with great speed and not in the same stable orbit of yesteryear. Changes come rapidly, and after the war this instability will continue. This means that the results of business operations must be booked for review more frequently than before and must contain more detailed information, enabling contractors to control operations and minimize losses before they run into real money.

Using ordinary double-entry methods, merely recording income and outgo as the money comes in and goes out, complete and current information is difficult or costly to obtain, particularly where contractors use systems not fitted to their needs, a condition one meets too frequently in the field. You must fit a system to your business. Never try to fit your business to a system. The double-entry bookkeeping system that can be operated economically by a big contractor is too cumbersome for a small contractor, yet often the small fellow will try to use it and, finding it too costly or unworkable, drops the matter, reverting to slipshod recordings on the assumption that accounting is an extravagance for him. We have found accounting forms of various kinds in many offices used no longer because contractors found them unworkable.

Costing vs. Bookkeeping

One troublesome factor is *costing*. Few contractors understand its purpose and they do not use or apply cost accounting properly because they misunderstand its purpose. Accounting has two divisions: one section to provide financial statements for historical analysis; the other section to provide job or production costs, which are mathematical estimates of operations and do not touch actual income and outgo.

For example, you pay for your materials according to the suppliers' invoices, not according to the materials listed on job orders or estimates. You pay labor for the actual time worked, not according to the time listed on cost records, which are kept separately from the dollars-and-cents transactions of your business, called the financial recordings. Cost records should be checked against financial records monthly. The difference represents the degree of efficiency.

The purpose of cost records is to *control the cost of current operations;* the purpose of financial records is to *record income and expense, assets, liabilities, and net worth,* to enable you to prepare the profit and loss statement, balance sheet and income tax return, to provide historical analyses to determine the trend of business from period to period and, by means of comparative studies, to help you determine where, how or when you lost or earned money on jobs.

Financial records are not classified to give you costing information. The accounts are arranged only to show income and outgo in detail, so you must build

cost records to enable you to estimate profitably the man-hours, materials, overhead and net profit required on each job. Even if you prepared a profit and loss statement monthly, you have only a composite picture which you might break down into the cost of labor hours, overhead cost per labor hour, the cost of materials per job, but you would have only historical information covering past performance, not a safe guide to tomorrow's operation, and you would have no way of knowing where, why or how you lost or gained on operations. Your financial records will tell you in detail from what source you received income and where you spent your money, but they cannot tell you how to estimate profitably on current business even though your financial recordings for a prior period are accurate. This is the function of cost accounting, which details the unit of sale in terms of costs, and we have discussed this matter at length because many contractors misunderstand its purpose.

Last Year's Costs No Good

Bear in mind that you cannot use a prior period's figures as a safe guide to the costing of current operations, yet many contractors and dealers assume that profit and loss statement analysis is the yardstick with which to measure current costs. Even where statements are prepared monthly they are not dependable bases for costing current operations, and in most cases contractors prepare statements only semi-annually or annually, which means that they are costing current sales on the basis of costs that may be a year or more old. Obviously, this is a dangerous practice in these hectic days and in the postwar period to come.

The contractor may contend that if he analyzes a profit and loss statement monthly and breaks it down to provide costing data that this is as close as he can get to accurate costing for the next month, but one month's costs cannot be used as a yardstick for any other month. Sometimes costs will double in one month, particularly in off-seasons when volume drops and overhead can't be cut. In seasonal industries it is customary to compare one month's results with the results for the same month the previous year to get a dependable comparison of ratios and costs. Another method is to take average or normal costs over the previous 12 months and compare with the current month's results, but such comparisons are historical and show only trends. Average costs cannot be used safely to cost current sales or jobs. They may be too high or too low. Remember that they extend backward for one year and a lot of water runs under the old millwheel these years.

Only a Budget Can Control Cost

Well, how does the contractor get a yardstick with which to estimate current costs? By means of a budget. Many contractors shy at budgeting, but without a budget you are only recording costs; you don't *control* costs, and *cost control* is the main purpose of costing. Budgeted costs are built upon average costs or seasonal costs, as shown on the profit and loss statement, plus standards of labor performance and the materials required for each job as compiled from experience records of jobs done and plus a forecast of future performance based upon analysis of current conditions and general trends inside and outside your business. When current costs are compared with budgeted costs, the difference is checked to source by means of the profit and loss statement, which gives departmental and overhead figures in detail.

On straight over-the-counter sales, the contractor has only to figure the margin and add to his purchase price. The ordinary retailer has an easy time costing sales. The grocer need not estimate the price of a pound of sugar before selling it. His cost work involves only a straight percentage spread based upon the margin needed to cover his overhead and net profit. But the ordinary retailer, although his costing routine is simple, must also use a budget to cost current sales properly. He cannot rely on profit and loss statement analysis alone.

Budgeting is not difficult and is the prescribed method for controlling costs in all fields. Large plants selling 2,000 or more different items budget their operations upon potential output, standardized costs, a review of prior operating figures and a forecast of future business. The warm-air heating dealer or sheet metal contractor, with a much simpler set-up, can do likewise without difficulty. You can't utilize cost control unless you budget. You can record experience figures to arrive at standards of operation and average overhead expense, but this historical information must be twinned with a forecast of future operation to materialize as cost control. This is established accounting practice.

Small businessmen, like bakers, laundryowners, cleaners and bottlers, contend that their problems are not comparable, that their plants are too small for controls used by big companies, but, more and more, they are accepting the advice of business counselors that the small plant can utilize the same controls as the big plant, and where this counsel has been adopted the results have been highly satisfactory. The fundamentals of accounting are applicable to a shoe repair shop or a big steel mill, but, of course, they must be adjusted to the business.

Essentials of a Good System

So, to summarize, a modern accounting system will provide:

1. Financial records of income, outgo, assets, liabilities and net worth. Also data for income tax returns.
2. Cost records showing estimated and actual costs on jobs.
3. Information that will enable the dealer or contractor to set profitable selling prices on over-the-counter goods.
4. Experience figures on job costs to aid in the preparation of estimates and standardized costs on specific jobs or certain types of installations.
5. Budgetary figures that serve as yardsticks to determine the efficiency of current operations.
6. A comparison of actual costs on completed job records with budgeted costs and standard costs and then a check-back against the monthly profit and loss statement to determine the reason for any difference.
7. Supplementary records, such as stock control cards, time slips, overhead control sheets, etc., recording gadgets that give precision control over labor, materials, overhead.
8. Departmental recordings to determine profit or loss per line or department.

Modernization always pays dividends. In prewar years, warm air heating dealers and sheet metal contractors accepted this as a business truism, but many who use modern equipment and preach modernization to customers continue to do business with the same

(*Continued on page* 126)

Interpretations, Amendments, Easements To Existing Orders

Tin Plate Change

MINOR amendments, including small-order exemptions, of Supplementary Order M-21-e (an order restricting use of tin plate, terne plate and tin mill black plate) were announced May 5 by the War Production Board.

A change in Schedule A raises from 1.3 to 4 pounds the permitted coating per base box on short ternes for roofing repair.

Hot dipped tin plate, electrolytic plate and terne plate, where total annual consumption of all these grades does not exceed 100 base boxes, are placed in Schedule B, which exempts them in this quantity from the controls of Order M-21-e.

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Evaporative Coolers Permitted

A PROCEDURE under which manufacture of certain types of evaporative coolers will be authorized is announced by WPB. The rules which will govern the manufacture of such items are contained in Direction No. 1 to Limitation Order L-38.

A manufacturer may obtain authorization to manufacture some of these coolers by filing before May 29, 1944, with the district office of WPB in the area where the production is to take place an application showing:

1. The total number of such coolers which he wishes to produce, and
2. The total number of motors he proposed to use which are available from inventories of used motors or from inventories of new motors in his hands or in the hands of another evaporative cooler manufacturer on April 1, 1944, and obtained for making such kind of coolers, or from inventories of new motors which a regional office of the War Production Board has certified as being frozen, idle, or excess stock, and the name and address of the holder and the quantity in such stock, and
3. The quantity of other materials which he will need to obtain from frozen, idle, or excess materials under Priorities Regulation 13, and
4. (a) The total number of production workers necessary for assembling these coolers; (b) the total number of employees to be transferred from other operations in his plant, indicating the relation of these employees to his war work. If war contracts are being terminated, cut back, or completed, indicate date, type of production under contract, procuring agency, and number and type of employees involved.

If the prospective manufacturer needs to get any motors or other materials which he is unable to buy because he cannot furnish the necessary ratings or meet other requirements under Priorities Regulation 13, he may apply on Form WPB-1161 for permission to purchase such materials from the frozen, idle, or excess stocks of a holder who qualifies to make a special sale of those materials under that regulation. If he wishes to use frozen, idle or excess motors in his own inventory, his request to use these should be included in his letter of application to produce.

If the application is approved, the manufacturer will be issued an authorization to purchase any frozen, idle, or excess materials needed and known to be available for delivery as a special sale under Priorities Regulation No. 13, whenever the material is of a kind which requires such an authorization.

Sales of coolers which will be manufactured under this Direction may be authorized only by the local WPB office in San Francisco, Los Angeles, or Phoenix, Arizona. Manufacturers may not make delivery of such coolers except upon receipt of an order which has been authorized by one of these local WPB offices.

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Period 4 and 5 Oil Coupons

AMDT. 6 TO REV. RO 11—FUEL OIL

PRESS RELEASE

Cleared and issued through facilities of the Office of War Information

Current Period 4 and 5 fuel oil coupons will continue to be good for deliveries of oil through September 30, the Office of Price Administration said today, rather than expiring on August 31 as previously announced. During October, any consumer still having unused Period 4 and 5 and definite value coupons will be able to exchange them at their local War Price and Rationing Boards for coupons valid through the 1944-1945 heating season.

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Latest Draft Status

THE Chamber of Commerce reports on the draft situation as follows:

"At long last, Selective Service has wrapped up in one package the scattered, and often-conflicting, regulations and orders about drafting men for the armed services.

"With the manpower goal of the Army achieved and that of the Navy virtually achieved, Selective Service has been able finally to make drastic reductions in its monthly calls to local draft boards; therefore the need for taking everybody available and not deferred no longer exists.

Summarized briefly, the situation shapes up like this:

Age 18-26: virtually all will soon be in uniform.

Age 26-30: men may be taken unless they are essential to an essential job.

Age 30-38: few to be taken; occupational deferments to be granted freely.

The important point for business men to bear in mind is that requests for deferment should be filed immediately so that draft boards will have something specific in their records on which to base a deferment for men over 25. The requests must be made on Forms 42-A or 42-B—probably the latter should be used in most cases—which are available at all draft boards.

Each individual case must be handled on its merits by the local boards which deliberately were made com-

pletely autonomous by Congress in the original Selective Service Act. Nevertheless, the boards frequently are guided, generally speaking, by directives or regulations or so-called orders from National Headquarters of Selective Service. Therefore, these expressions from that office, in view of the changed manpower needs, are a little more important than usual—and may stand indefinitely:

Rigid requirements for occupational deferment for registrants in the 18 through 25 year old group remain.

For the time being, those 26 through 29 who are found to be necessary to and regularly engaged in war production or in support of the national health, safety or interest, have the prospect of remaining in civilian life.

The prospect for those 30 through 37, regardless of their physical condition, and for any registrants who are disqualified for general military service or qualified for limited military service only, and who are engaged regularly in and remain in war production or in support of the national health, safety or interest is that they, too, will remain in civilian life for an indefinite period.

The number of men required to bring the armed services to required strength is now relatively small. The armed forces have indicated that their greatest immediate need is for physically-fit men in the younger age groups, capable of the highest degree of efficiency under combat conditions.

Officials estimated that only 150,000 to 200,000 men 26 and over need be drafted the rest of this year.

Invasion replacements might throw all of these calculations out the window. But at least there is only one major factor to be considered now. Heretofore, there were many.

On the other side of the ledger consider this: more than 74,000 veterans of the current war were placed in civilian jobs in February and March through the United States Employment Service.

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NHA Approves Construction

DIRECTIVE No. 24, which delegates authority to the National Housing Agency for housing construction, was amended May 25 to permit NHA to issue approvals in the name of the WPB on the form required by any L, M, or P order for the purchase of building products and materials for such housing projects as now come under the jurisdiction of NHA.

Approvals may be issued only for products or materials whose permitted use is authorized by the War Housing Critical List and the War Housing Standards under Limited Preference Order P-55-c. Effect is thus given to the processing of the required application forms by NHA, but retains in WPB determination of the quantities of building products and materials to be made available for housing.

The authority delegated to NHA is expanded to authorize the approval of construction, remodeling, repairs and installations of housing projects owned, constructed or performed "by any Federal Agency under the jurisdiction of the National Housing Agency" without requiring the filing of WPB Form 2896.

Schedule B, which defines the types of construction over which NHA is granted jurisdiction, has been amended to clarify its authority over the remodeling or conversion of any building to be used for the sole purpose of providing living accommodations.

New Army-Navy Priority

PART 3175—REGULATIONS APPLICABLE TO THE CONTROLLED MATERIALS PLAN
[CMP Reg. 6, Direction 3]

SPECIAL PROCEDURE FOR ARMY AND NAVY CONSTRUCTION

(a) *What this direction does.* This direction explains how private contractors doing Army and Navy command construction, Engineer Corps construction or Civil Aeronautics Administration Construction obtain controlled materials, Class A products, and other materials and products which they need for the construction work. This direction applies only to construction of the kinds described in paragraph (f). It does not apply to any other kind of construction.

(b) *Allotment symbol and preference rating.* The Army or Navy will issue an authorization for construction on Form CMPL-593 Navy (Army). The allotment symbol N-O for Navy construction or W-6 for Army construction and the preference rating assigned on Form CMPL-593 Navy (Army) may be used to order all products, machinery, equipment and material needed to complete the project described in the CMPL-593 Navy (Army). In certain cases, an order of the War Production Board may require specific authorization on a special form or letter before a person may get or use a particular product or material. In such cases, the Bureau of Service indicated in the executed Form will obtain such authorization, including any scheduling authority required under any scheduling order, and will furnish the authorization, either on the prescribed form or otherwise to the person engaged in the construction.

(d) *How to order material.* (1) The allotment symbol N-O for Navy construction or W-6 for Army construction may be used to order controlled materials and Class A products by (i) the person to whom Form CMPL-593 Navy (Army), is issued, whether a private contractor or an Officer of the Army or Navy, (ii) by manufacturers of Class A products or Class A components of Class A products to be incorporated in the project, (iii) by subcontractors doing all or any part of the construction work.

A builder must not use the allotment symbol or give others the right to use it before he has received an authorization on Form CMPL-593 Navy (Army). A person who has received an authorization on Form CMPL-593 Navy (Army) may give a manufacturer, contractor or subcontractor the right to use the allotment symbol by endorsing the order or contract in the following form, signed manually or in the way explained in Priorities Regulation No. 7:

> Purchase Order or Contract No.....
> (identifying project). You are authorized to use the allotment symbol N-O (W-6) to order controlled materials and Class A products needed to fill this order or contract.

It is not necessary to show the quantities of controlled materials in this statement.

(2) The preference rating may be used to order all materials other than controlled materials. The builder receiving a CMPL-593 Navy (Army) authorization may use the preference rating on an order by using the certification set forth in Priorities Regulation No. 7 together with the allotment symbol N-O or W-6 for purposes of identification. Whenever the builder or subcontractor orders a Class A product

(*Continued on page* 107)

Arnold Kruckman's

Washington Letter

The New Manpower Regulations

MANPOWER Chairman Paul V. McNutt went up on the Hill recently and invited 36 Senators to lunch in the Vice-President's dining room in the Capitol and explained the new order which places ALL male workers, regardless of age or condition, under control of the Federal Government. After McNutt paid the check few of the Senators had much to say. Most of those who would comment appeared to think the plan will work and that it will make a labor draft law unnecessary. Senator Wherry, the new man from Nebraska, who also is Republican minority "whip," said he did not think the War Manpower Commission "has any legal authority to enforce the priorities on which the whole scheme is based."

A few days before, on the Floor of the House, Congressman William J. Miller, of Connecticut, made a protesting address pointing out "this so-called controlled hiring plan has been put into effect in every industry, factory, store, and business of every kind. I wish some lawyer Member of the House would point out to me some provision of law that gives War Manpower Commission the right to say to a citizen, 'You cannot work in such and such an office' or to a manufacturer, 'you cannot employ any one unless they come to you with a referral (permit) from the United States Employment Service.' I am not a lawyer, but if I understand the language of our Constitution, such regulations are clearly unconstitutional. These regulations are simply invoked to implement the purposes of a national service act without waiting for Congress to pass such an act."

Legal Basis of the Order

It is curious that this Order, which marks such a profound change in the relation of the citizen and the Government, first was announced by McNutt on May 19 in a release (PM-4583) which apparently was entirely overlooked by the news reporting services and commentators. The statement, circulated in the usual manner, announced that WMC regional directors had been authorized "to extend the program for directing ALL male workers to jobs through the United States Employment Service or such channels as USES may designate. This will permit a better allocation of available male labor. Up to the present time such controlled referral has been limited to Group 1 and 2 areas in which labor has become very scarce. The extension to Group 3 and 4 areas is a recognition of the fact that, even in areas of more plentiful labor supply, male labor suitable for jobs that can be filled only by men is exceedingly limited.

"This action takes the form of an amendment to Regulation 7 which governs the employment stabilization program." (This Regulation is based on Executive Orders 9230 and 9258.)" It becomes effective May 22. This amendment will make it possible for a regional director to control placement of men in certain age brackets; for instance, those between 18 and 45. From the point of view of the individual (the worker) it will make it impossible for him to get a job in NON-ESSENTIAL or even in ESSENTIAL activities unless he is sent there by the United States Employment Service, even though he may have a statement of availability from his employer. This program is in keeping with the established principle that ALL persons have an obligation to engage in work most directly affecting the war program.

"Another amendment to Regulation 7, intended to strengthen the Commission's system of instituting employment ceilings, *limits the number of workers or specified types of workers that may be employed in an establishment during specified periods.*"

New July 1 Regulations

It will be noted this announcement did not exempt any male workers from the program. Farm labor apparently was included. On June 4 McNutt issued another Order directing his regional directors to put the program into effect not later than July 1. Four steps were indicated:

"1. Establishment of a nation-wide system of priority referrals, after consultation with regional and area committees to the degree necessitated by regional and national manpower demands, which provides that employers shall hire ALL male workers only from those referred by WMC's United States Employment Service, or by approved arrangements.

"2. Setting employment ceilings in the 184 areas of labor shortage as defined by WMC. These are cities listed as Group 1 and Group 2 areas. *The ceilings fix the total number of men who may be employed in specified establishments.*

"3. Creation of manpower priorities committees in all these areas. These committees will decide which industries in their respective areas are entitled to priorities in the referral of available male labor.

"4. Intensification of the recruiting activities of USES so that men MAY BE TRANSFERRED

FROM AREAS OF LABOR SURPLUS INTO AREAS WHERE URGENT WAR PRODUCTION REQUIRES MORE LABOR.

"The plan will make it possible for a worker *anywhere* in the country to take his most useful place in the industrial firing line.

"Priority referral is a program providing that employers, *except those in agriculture,* may hire male workers only from those referred by WMC's United States Employment Service, or in accordance with arrangements approved by the USES. *Every WMC area in the country will have considerable latitude in determining the detailed application of its priority referral plan.*"

The controlled priority plan in the past has been known as the controlled referral plan. It is explained here this is the Government's substitute for the National Service Act. The difference is defined thus: a special law would have put workers under complete control on a nation-wide basis; the WMC plan applies the control variably according to needs of a region. At present the greatest emphasis is placed on Group 1 and Group 2 areas. In these areas workers will be rationed or allocated to all establishments which employ eight or more. In essence they will be supplied with male help virtually in the same way as manufacturers are allotted steel, copper, aluminum, under the Controlled Materials Plan. And they will be given preference ratings much as they are given priorities to obtain other components and materials. The highest preference ratings will go to those who are engaged in war work or in essential civilian work. Generally speaking, the classification of an industry or service as critical, essential, or "locally needed", in the Selective Service or War Manpower lists, will determine the priority of an establishment in its claim for workers.

Number You Can Employ Is Fixed

Ceilings for the number of workers to be employed are fixed by various means. In Baltimore, unless specifically authorized by the area manpower director, no employer is permitted to hire any worker if the hiring causes the total full-time employment of workers in his establishment to exceed the maximum number of full-time employees on his payroll on any one day from April 15 to May 1, 1944. If, however, an urgent war job makes it necessary to employ more workers than fixed by the ceiling, the area director in Baltimore, upon recommendation of the Manpower Priorities Committee, may authorize the establishment to hire a specified number in excess of the ceiling. In Detroit the employment ceilings in a plant are set either on the total number of workers employed on a fixed day, or the total number of male workers employed on the specified day, but in neither instance are veterans employed included in the figure that sets the ceiling. The ceiling is usually fixed by determining a base, and for two weeks thereafter the male workers are calculated as constituting 97% of the total number employed on the basic date. Replacements for any reason may not exceed the percentage, always excepting veterans. After two weeks the ceiling comes down to 92% of the number on the payroll on the basic date. In Baltimore part-time workers are not calculated in the ceiling. In other words, the employer with 50 full-time workers on his payroll and 20 part-time workers would be regarded as operating under a ceiling of 50 workers.

The establishment which rates high as providing war service or essential civilian service will find the USES office is ready to facilitate its supply of manpower. If the USES people know the business, and the people who run the business, the USES officials will be inclined to cut red tape by giving the required approval for hiring over the telephone. It is obvious that it will be sound sense to get well acquainted with the local WMC personnel, and with the officials of the USES who handle your affairs. Get from the USES office Form ES-270 and fill it out as quickly as possible. This will record your requirements. Also see the local Production Urgency Committee which determines your place in the scale of preference; and after you have secured your rating through the Production Urgency Committee get in touch with the Manpower Priorities Committee which will largely be responsible for determining the kind and type of worker with which you will be supplied. If there are not a sufficient supply of workers in your own area to fill your needs you will be obliged to recruit your help from areas where labor is more plentiful. It will then be your job to send some one into those areas to prod the USES offices there to help you find workers. In case your preference rating is low you either must face the problem of surrendering your workers and getting out of business, or of swiftly finding women to take their places. The establishment, with only faint hopes for preference, must now move fast to be prepared to tap new sources of help.

Machinery Needs "Shake-Down" Test

There is as usual some fogginess about the machinery of the plan. You never quite know about these Government phenomena whether the fog is artificial or natural. The program heads up to the area or the regional director. He makes it tick. But somewhere in the main works there also is the Labor-Management Committee. It is composed of the area director as chairman and with representatives of labor unions and local commercial organizations as members. It is not possible to determine exactly what the Labor-Management Committee does, or how far its power goes, except that it seems to pervade all the major determinations. The Committee is appointed by the WMC area director. Apparently the idea is to place the Labor-Management Committee in such situation that it may mean much or little.

The Manpower Priorities Committee probably is the most potent group from the standpoint of the employer. It controls the spigot that makes the workers flow to the various individual establishments. It also is headed by the WMC area director and has as members representatives of the Selective Service, Army, Navy, Aircraft Resources Control Office, Maritime Commission, ODT, Civil Service Commission, WFA, and War Shipping Administration. The Production Urgency Committee is virtually the same, made up of the representatives of the same agencies, but is headed by a representative of War Production Board. This Committee tells the other Committee which job is the most urgent, and which establishment has the most urgent need of workers, and what kind of workers it needs.

Congressman Miller has told the House that the employer who hires more workers than permitted, or who hires a worker without a referral slip, (which is a permit issued by Government), is liable to a fine of $1,000. WMC has told trade association officials here that employers who violate the regulations may be

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On Our Industry's Front

Warm Air Furnace Industry

MEMBERS of the Warm Air Furnace Industry Advisory Committee meeting with government officials were told the volume of anticipated production for the second quarter of 1944, according to estimates submitted by the furnace manufacturers on Form WPB 3316, is well above the first quarter production level. Committee members felt that the figures for the second quarter were over-optimistic for a number of reasons. The loss of men, especially supervisory personnel, to the armed services was cited as one deterrent to increased output. Foundries are finding it increasingly difficult to get replacements for the men they have lost, and the Committee felt that this factor would determine the number of cast iron furnaces to be produced. The fact that most of these manufacturers are engaged in filling war contracts, many of which must take precedence over furnace production, was another reason why the group felt that output would probably decrease rather than increase during the second quarter.

Indications that there will be an increase in requirements for small furnaces, used principally in housing, during the third and fourth quarters of 1944 caused government officials some concern, since few furnaces of this type are now being manufactured. Members agreed that the industry itself should attempt to increase output of the 18 in. and 20 in. furnaces, and that government action on the problem should be postponed until industry has had an opportunity to try to meet requirements.

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Critical Foundry Labor

CHAIRMAN Donald M. Nelson and other officials of the War Production Board have conferred with representatives of six unions concerning steps to relieve the critical manpower shortages in the foundry and forge industry, which is expected to meet 20 per cent higher war-equipment schedules by fall, in the face of increasing inability to obtain and hold manpower under prevailing wage rates and working conditions.

The key plants in the foundry and forge industry number about 300, all of which are doing at least 75 per cent critical war work. These vital plants, employing 200,000 men, have already lost five per cent of their labor force through the draft during the last two months, and will loose at least another five per cent in the immediate future, WPB said. Coupled with the draft losses is an abnormally high rate of labor turnover due to onerous working condition and low wages, plus the fact that the onset of summer heat normally makes a huge inroad into the industry's working force, the agency added. WPB estimates, as presented to the committee during yesterday's meeting, show that at least 20,000 additional workers, mostly common laborers, must be obtained immediately if production is not to suffer a drastic slump.

A movement has already been initiated by WPB to obtain readjustment of the wage inequalities in the industry through presentation of the entire problem to Office of Economic Stabilization.

Among the solutions is possibility of importing Mexican nationals to fill unskilled jobs in foundries and forge shops, as has already been done in the case of railroad track maintenance and agriculture. This possibility was outlined as involving use of Mexican workers only on an emergency basis, under a six-month contract, with employment of the Mexican workers to be limited to unskilled work under provisions acceptable to the labor unions concerned.

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Few More War Plants

JAMES F. BYRNES, war mobilization director, says that reductions in war production programs totaling $18,000,000,000 already had been approved or were indicated and that the American people must realize that the era of war plant construction and expansion was at an end.

Mr. Byrnes emphasized that the cutbacks were not primarily for the purpose of producing civilian goods and had been made to give war programs that are urgent the right of way over those no longer urgent.

He said, however, that the nation must begin now while the armed forces were winning the war to prepare for the transition to peace so that industry, labor and agriculture would be relieved of the fear of post-war depression and unemployment.

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1944 Repair Volume

EXPENDITURES for maintenance and repair of residential and other construction this year will be about 17 per cent less than the total for last year, James W. Follin, managing director of the producers' council, has forecast.

Mr. Follin said about $3,000,000,000 will be spent on such work this year, or less than in any year since 1939. This, he added, despite the great accumulated demand for repair work on the part of home owners, business concerns, and others.

"Adding the estimated $4,600,000,000 of new construction to the expenditures for maintenance and repairs, the total value of new construction and maintenance in 1944 would amount to $7,600,000,000, or slightly more than one-third of the estimated average for the five-year period following the war, which will be $21,600,000,000, according to the committee's forecast. The latter figure is based on the assumption that the cost of construction during the period in question will be 30 per cent higher than in 1940."

New Peak Predicted

The committee found that expenditures for maintenance and repairs would rise to $3,900,000,000 in the first year after the war, and that this total, larger than in any preceding year, will not be large enough to catch up with all necessary repairs.

Mr. Follin predicted that in the following five years an average of $5,400,000,000 would be spent annually.

"It is believed that the amount of building materials and equipment available for repair and maintenance in the first postwar year will be reduced by the heavy demands for building products needed in

new construction enterprises, particularly for new dwelling units," Mr. Follin reasoned, adding:

"The estimated volume of repair and maintenance for the current year is greater in proportion to the amount of new construction than in any preceding year.

"However, it represents only part of the actual need, which is greater than usual on account of the abnormally intensive use being made of existing structures and the inability to replace or renovate them under wartime conditions."

Manufacturers thus would be required to produce materials and equipment at the rate of almost $10,000,000,000 annually to meet the average demand, during the five years, Mr. Follin said.

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AC Repair Parts Scarce

INVENTORIES of repair parts for refrigeration and air conditioning equipment are dangerously low at present, the General Refrigeration and Air Conditioning Industry Advisory Committee reported to WPB.

To correct this situation, the committee recommended (1) that WPB make every effort possible to expedite processing of Form WPB-547 (formerly PD-1X), (2) that a higher rating be made available to the industry for obtaining production materials with which to make the necessary repair parts, (3) that inventory provisions of Order L-63, distributors' inventory limitation order, be relaxed to take care of seasonal demands for repair parts for refrigeration and air conditioning equipment, and (4) that all other possible steps be taken to speed deliveries of repair parts to replenish diminishing inventories.

The committee received a report from WPB officials on the current availability of Freon 12. The supply of this item continues to be short, and May allocations will not provide for any but the most essential uses.

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Postwar Plans of 10 States

INDICATIVE of the progress being made by individual states in planning for the postwar period were the reports of planning officials of 13 states at the meeting of the American Society of Planning Officials, just concluded.

Following is a brief summary of the progress reports of ten of the states:

New Jersey—393 proposals for postwar public works, estimated to cost $351,000,000, have been submitted to the New Jersey Planning Board by 17 state agencies. Of the total $15,000,000 or 4 per cent is in the blueprint stage, of which, in turn, $12,000,000 is for highway widenings, repairs and bridges, leaving $3,000,000 for the other 16 departments.

Wisconsin—In January, the state legislature accepted and approved a report of the joint interim committee on postwar planning for rehabilitation of state institutions in the amount of $17,500,000. Funds to meet the cost of the project are to be taken out of income taxes and the money accumulated and earmarked for this purpose. (See AA report of Wisconsin convention, March, page 82.)

Pennsylvania—Postwar plans include a $500,000,000 five-year state highway program and many other smaller projects.

Michigan—A veterans' reserve fund of $1,000,000 has been created for the 500,000 men in service.

Virginia—Projects totaling $50,000,000 have been planned and proposals for an additional $160,000,000 are on hand. The 1944 general assembly passed (1) a regional planning enabling act; (2) a public works reserve act, clarifying the legality of setting aside reserve funds for which there is no specific tax levy, but which can be used legally for postwar construction, and (3) legislation creating a commission on surplus federal property which may become available for state use.

Washington—A research fund of $150,000 has been created for the study of new markets for magnesium and light metals found in the state.

Massachusetts—The entire postwar program has been predicted on the ability of the state and its various governmental units to finance themselves. No ceiling has been placed upon the amount of money to be spent on planning by the state with $700,000 immediately available, pointing to a construction program of $20,000,000. Eighty projects have been approved so far at an estimated cost of $14,000,000.

New Hampshire—More than 60 per cent of the state postwar program has been blueprinted. Largest single problem is water polution. State has passed permissive legislation enabling local communities to set up funds for capital expenditures for postwar projects. Although communities will be expected to finance their own construction, state aid, it is felt, may be required to meet the cost of sewage disposal projects in order to eliminate the threat to the state's tourist and vacation trade.

Utah—Permissive legislation is being planned to permit all taxing bodies to levy within their legal ability for postwar development. Legislation is also being planned to insure orderly disposal of excess defense housing which, it is felt, might offer a serious threat to legitimate real estate ownership values in the postwar period.

Indiana—No specific funds are available for assisting cities and towns in their postwar planning. Some of the larger cities are able to finance their programs as well as most of the construction work planned, but in most instances funds in smaller towns and communities are lacking.

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No Increased House Building

THE report that the War Production Board soon will issue priorities and release building materials for a partial resumption of normal private housing construction is denied by WPB and the National Housing Agency.

No such decision has been made, according to a statement by WPB and NHA, and construction is still limited to the war housing program in the same measure it has been in the past.

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Class B Stoker Status

REPORTS the Stoker Manufacturers' Assn: Fractional horsepower motors are still tight and from all information available will continue to be tight for several months. Aside from the motor situation, the recent developments in manpower seem to be of more concern than anything else to both Government agencies and industry. The labor situation in all critical areas designated 1 and 2 appears, to Washington officials at least and to the Army and Navy, as

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The Louisville "Bid Depository" Plan

ONE of the committees appointed by the Sheet Metal Contractors National Ass'n, in convention, in Chicago, last month was a Trade Relations committee and one of the duties charged to it was to investigate ways and means to stop bid peddling, and to look into successful plans now in operation.

There are not, now, many cities where anything constructive has been done to stop bid peddling. Two cities reported an operating bid depository—Louisville and Buffalo. Since not too much is known, among the trade about these depositories, AMERICAN ARTISAN, in paragraphs following gives the summary of the Louisville plan. No explanation will be attempted because the editor is not familiar enough with the Louisville depository to analyze the operation or explain it. Readers having questions, therefore, are requested to write to J. E. Merrick, Falls City Cornice & Roofing Company, 800 E. Madison St., Louisville. Mr. Merrick is a member of the committee and is also a charter member of the builders exchange and active in bid depository affairs.

The Louisville Plan

The undersigned sub-contractors of Louisville, Kentucky, have adopted and will put into effect on July 1, 1940 a plan to be known as "SUB-CONTRACTORS FAIR BIDDING PRACTICES." As its name implies the plan is designed for the sole purpose of maintaining a fair and equitable basis of competitive bidding relations. It will not be restrictive nor discriminating. It establishes reasonable standards which are within easy reach of all who desire to play fair. The practice known as bid peddling and bid cutting is outlawed. Our sub-bids, written and sealed, will be available for the general contractors at the Builders Exchange (Bid Depository) at a standard designated hour, well in advance of the awarding authority's bid date so as to give the general contractors ample time to prepare their estimates free from interruptions and uncertainties of late bid deliveries, eleventh hour telephone calls, etc. The plan follows:

1. *Area Embraced.* Jobs in Jefferson County, Kentucky, with the exception of such Federal projects as Post Offices, PWA and Municipal Housing. It is the intention of the subscribers to "Fair Bidding Practices" that its provisions shall not apply to transactions in interstate commerce.

2. *Branches of Work.* (With minimum filing limit)

PLUMBING	$250.
HEATING	250.
ELECTRIC WIRING	75.
PLASTERING	100.
PAINTING	100.
SHEET METAL	75.
BUILT-UP ROOFING	75.
ORNAMENTAL IRON	200.

3. *Bid Depository.* The Builders Exchange is located at 633 South 5th St., Louisville, Kentucky, is designated as the official Bid Depository.

4. *Sub-Bidding to the General Contractors.*

(A) All sub-bids, both originals, and duplicates, must be filed in separate sealed envelopes with the Bid Depository not later than 1:00 P. M. the day prior to the awarding authority's date. (10 A. M. if the general bids go out of town.) The original bids for the general contractors shall be plainly marked on the outside of envelope with bidder's name, name of recipient, and name of job. The duplicate shall be plainly marked on the outside of envelope with bidder's name, name of job, and names of general contractors for whom his original bids have been filed. If the bids are mailed to Bid Depository, they must be postmarked not later than the day prior to the deadline for personal delivery, to insure their acceptance in any mail reaching the Bid Depository after the standard 1 P. M. hour. In computing filing dates, do not count Sundays or Legal Holidays.

(B) The sub-bids shall be available to the general contractors immediately after the 1 P. M. closing hour. The general contractors, are not limited to the bids of the undersigned sub-contractors, however, in accepting the bids for any branch of work from the Bid-Depository, the general contractors are expected to accord them the same consideration that their group expects from the awarding authority.

(C) When the general contractor becomes the awarding authority and desires the sub-bids from one or more branches, he shall establish a closing hour, and receive such sub-bids through the Bid Depository as provided in 4-A and 4-B.

5. *Sub-Bidding Direct to Owner or His Representative.*

(A) Duplicate of bid must be filed with Bid not later than the time set by the Owner or his representative.

(b) In the absence of a definite date, the duplicate of bid must be delivered to Bid Depository the same day the original bid is delivered to bid taker.

6. *General Rules.*

(A) Sub bids even though believed to be non-competitive must be filed with Bid Depository in the same manner as bids known to be competitive.

(B) Supplemental or revised bidding shall be governed by those rules in the same manner as original bidding.

(C) Revised bids must be in proportion to the amount involved in the changes.

(D) The practices commonly known as "bid peddling" or "bid cutting" are recognized as unfair and are prohibited.

(E) After the closing hour, in the event of a discovered mistake, any bid may be withdrawn prior to its acceptance or use by the general contractor, but not corrected.

(F) There shall be no collusion or price-fixing.

(G) Approximate estimates are not considered a bid.

7. *Duties of Bid Depository.*

(A) The Bid Depository shall time stamp each bid received. It shall keep individual job files for each branch. With the exception of sub-bids which are filed by the general contractors, the Bid Depository shall only receive sub-bids from subscribers to this document.

(B) The Bid Depository shall open and tabulate the duplicate bids not earlier than closing hour. Such tabulation will then be sent to each subscriber bidder. All details as to bids filed shall be held strictly confidential between the Bid Depository and the subscriber bidders on a job. Only comparable figures shall be tabulated.

(C) Single or non-competitive bids shall be kept sealed and filed by the Bid Depository.

(*Continued on page* 116)

RESIDENTIAL AIR CONDITIONING

SECTION

DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

"Watch me take these birds to the cleaners with this Automatic Golf Ball!"

• Does your golf score equal your blood pressure? Do you throw away your clubs periodically and vow never to play that——!! ———* game again? Then cheer up, my friend. It is rumored that the post war dreamer boys have come up with another world shattering innovation. It is an automatic golf ball—*self-propelling, self-steering, self-stopping, self-cleaning and self-finding* —that will enable you to lick the pants off those highbinders who have been living a life of luxury on your lost bets.

Just tee up the ball and tap it gently. That sets off an internal rocket propeller and away she goes for a 300 or 400 yard drive. For shorter distances you can set the ball accordingly. It goes straight for the pin because it contains an automatic steering device. It's bound to drop on the first putt every time—leave it to the self-steering, self-stopping features.

If you should get into the rough, don't worry —the self-finding device will set off a signal to locate the ball. Of course, someone in the foursome ahead may find it before you do. But we can't take all the hazards out of golf, otherwise we might as well play the whole game at the 19th hole. Maybe we've got something there!

Will such a dream ball come true? Well, most anything is possible . . . *in time.* In time, too, we believe that many ideas that now seem visionary will, *in the process of evolution,* become realities. New ideas, new features and new applications develop naturally and progressively as new needs and changed conditions require. We look for startling innovations in many things—in houses, motor cars, refrigerators, kitchen ranges and heating equipment, to mention only a few.

Rybolt engineers are planning and working now upon important new developments that will greatly advance heating efficiency. They won't be ready tomorrow, or next day, but when they come, you can depend upon it, they will be very much worth while.

BUY MORE WAR BONDS!

THE RYBOLT HEATER COMPANY

615 MILLER STREET ★ ASHLAND, OHIO

American Artisan's Survey of Heating Equipment Service

WASHINGTON has announced that a major effort will be made this summer to have home owners put their heating plants in good condition as a direct contribution to the nation's 1944 fuel conservation drive.

Several weeks ago, when this program was first talked about, American Artisan mailed to one thousand contractor readers a questionnaire asking for a report by the dealer on the services he is now offering on oil burners, stokers, furnace cleaning, heating controls, furnace blowers, filters—and for a report on the dealer's present manpower situation.

With the need for fuel conservation to insure high war production everyone will agree, but it is quite one thing to convince home owners they should have their heating plants serviced and quite another matter when the home owner, trying to get the work done, finds service extremely difficult to obtain. Therefore, any national program for heating plant service, should know for certain that such service is available.

The truth seems to be that many firms which sold oil burners or stokers exclusively and offered service for good will or profit went out of business when production of oil burners and stokers was stopped. And other firms which offered furnace cleaning and service (coal dealers, for example) now find their manpower shortages too acute to permit them to do heating plant service work.

Fortunately for the public, the warm air heating dealer who always has been the most important factor in heating plant service has been able by one means or another to remain in business—he may not have as many men working for him as he had in 1939; many of his best men have been taken by the armed services; he may now be "rushed to death"—but he is still serving the public.

And also fortunately for the public, the warm air heating dealer seems to have adopted the theory that service is part and parcel of heating and only the very best men—with the most experience—are qualified as service men. The report on Manpower which follows plainly shows that the service man of the usual warm air heating dealer has an average of ten years employment—with the dealer and an average of 13 years service experience. Warm air heating dealers seemingly have not followed the practice of hiring boys and giving them glorified titles of "heating engineers" based upon a six months' "quickie" in service work. So the service men of our industry are still good and are still available.

This survey will appear in three issues. Since Manpower is the key to the whole program, this issue reports on the Manpower situation together with reports of what we are doing in Filter and Blower service.

Our need for serious consideration as an essential civilian activity is plainly shown in the first columns of the manpower report which list the many services now demanded of this industry. The next column which shows so many dealers doing all this service with one man and Column 1 showing how many dealers are now doing service work personnally are clear-cut indications we need manpower consideration if this industry is to keep home owners comfortable next winter and reduce fuel consumption by raising the efficiency of the home heating plant.

OF THE total of 171 dealers reporting — 98 are servicing controls; 91 service stokers; 93 service oil burners; 90 service filters; 129 do furnace cleaning — and in 81 cases one man is doing all service on all these devices. Manpower is so short in many areas that the owner is either doing all service work personally or is at least helping to service.

This study further discloses that service manpower is so short that practically every service man is working a full week and overtime — most dealers report serious shortages in service manpower — and only 71 shops have been able to get their service men deferred as essential.

Column 2 shows that the average service man has been in the shop owner's employ 10 years and Column 3 shows that the average service man's experience covers an average of 13 years (note how many service men have 15, 20, 25 years experience). Service men, this study discloses, cannot be trained in a few months' time.

MANPOWER

State and City	Do You Have a Man to Service Each of the Following, or Does One Man Do All Service? (Y=Yes; N=No; ...=No Reply)						No. 1		No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
	Controls	Stokers	Oil Burners	Filters	Motors	Cleaning	One Man Does All Service	Do You Do Service Work Yourself?	How Long Has Your Service Man Worked for You?	How Many Years' Experience Has He Had?	Has He Had Any Special Training? (Note A)	Does Service Man Devote Full Time to Service?	Is There a "Service Pool" in Your City?	Have You Had Service Men Deferred?	How Many Heating Plants Can One Man Service?
ALABAMA															
Montgomery	...	...	...	...	...	...	Yes	Yes	15 Yrs.	15	.....	Full Week	No	No	?
ARIZONA															
Phoenix	...	...	...	...	...	...	Yes	Yes	2 Yrs.	6	No	Full Week	Trade	.....	No
Tucson	Y	...	Y	...	...	Y	.....	No	8 Yrs.	10	No	Full Week	No	Yes	No
ARKANSAS															
Paragould	Y	Y	Y	Y	Y	Y	No	.....	5 Yrs.	5	No	48 Hrs.	No	No	No
CALIFORNIA															
Bakersfield	...	...	...	...	...	...	Yes	Yes	.....	....	.....	.....	.....	.....	No
Eureka	Y	Y	Y	Y	Y	Y	No	Yes	6 Mos.	None	No	Full Week	No	No	.....
Oakland	...	...	...	...	...	...	Yes	No	17 Yrs.	20	Factory	Full Week	No	Yes	.....
San Mateo	...	...	...	...	...	...	Yes	Yes	7 Yrs.	7	6 Mos.	Full Week	No	No	350
CONNECTICUT															
Waterbury	...	...	...	...	...	...	Yes	No	7 Yrs.	7	Elect.	Full Week	No	Yes	.....
DELAWARE															
Laurel	Y	...	Y	Y	Y	Y	No	.....	10 Yrs.	10	No	Full Week	No	No	Varies
ILLINOIS															
Belleville	...	...	...	...	...	...	Yes	.....	15 Yrs.	....	.....	48 Hrs.	.....	.....	.....
Bloomington	...	...	...	...	...	...	Yes	Yes	.....	None	None	No	No	.....	100
Chicago	...	...	...	...	...	...	Yes	No	3 Yrs.	15	None	No	No	.....	?
Chicago	Y	N	Y	Y	Y	N	No	No	15 Yrs.	5	Special	On Call	No	Yes	No
Elmhurst	Y	N	Y	Y	Y	Y	No	Yes	10 Yrs.	10	Elect.	Full Week	No	Yes	800
Forest Park	Y	N	N	N	N	Y	Yes	Yes	12 Yrs.	12	Elect.	On Call	No	No	350
Highland Park	N	N	N	N	N	N	Yes	Yes	3 Yrs.	20	None	Full Week	No	No	.....
Jacksonville	Y	Y	Y	Y	Y	Y	No	No	8 Yrs.	10	Yes	Full Week	No	Yes	200
Kankakee	...	...	...	...	...	...	No	Yes	15 Yrs.	35	None	Full Week	No	No	.....
Lincoln	Y	Y	N	Y	Y	Y	No	.....	6 Yrs.	6	None	Full Week	No	Yes	.....
Mattoon	...	...	...	...	...	...	Yes	Yes	7 Yrs.	7	None	Full Week	No	.....	.....
Moline	...	...	...	...	...	...	Yes	No	12 Yrs.	25	None	Full Week	No	No	.....
Naperville	...	...	...	...	...	...	Yes	Yes	17 Yrs.	17	.....	Full Week	No	Yes	.....
Ottawa	...	...	...	...	...	...	Yes	Yes	.....	....	.....	.....	No	.....	.....
Paris	N	Y	N	N	N	N	Yes	.....	15 Yrs.	....	None	48 Hrs.	No	No	.....
Peoria	Y	Y	N	Y	Y	Y	No	.....	15 Yrs.	15	.....	Full Week	.....	No	.....
Quincy	Y	Y	Y	Y	Y	Y	.....	No	2 Yrs.	10	Yes	Full Week	No	No	.....
Rock Island	...	...	...	...	...	...	Yes	Yes	4 Yrs.	4	None	Full Week	No	Yes	?
Sheldon	N	Y	...	Y	N	Y	Yes	Yes	.....	....	.....	Full Week	No	No	200
Wilmette	Y	Y	Y	Y	Y	Y	.....	No	2 Yrs.	2	None	Full Week	No	Yes	.....
INDIANA															
Brazil	Y	Y	Y	Y	Y	Y	Yes	No	8 Yrs.	8	None	Full Week	No	Yes	.....
Columbia City	Y	Y	Y	Y	Y	Y	No	Yes	4 Yrs.	4	None	Full Week	No	No	.....
Evansville	Y	Y	Y	Y	Y	Y	No	No	10 Yrs.	15	None	Full Week	No	.....	.....
Fort Wayne	Y	Y	Y	Y	Y	Y	No	Yes	1 Yr.	10	None	Full Week	No	No	500
Fort Wayne	...	...	...	...	...	...	Yes	Yes	8 Yrs.	8	Factory	Full Week	No	Yes	.....
Fort Wayne	Y	Y	Y	Y	Y	Y	No	No	10 Yrs.	20	Factory	Full Week	No	Yes	No
Hammond	Y	Y	Y	Y	Y	Y	Yes	Yes	3 Mos.	18	No	Full Week[b]	No	No	.....
Indianapolis	Y	...	Y	...	...	Y	No	Yes	7 & 20 Yrs.	7 & 20	Yes	Full Week	No	Yes	?
Lafayette	...	...	...	...	...	Y	Yes	Yes	.....	....	.....	.....	No	.....	.....
La Porte	Y	Y	Y	Y	Y	Y	Yes	No	25 Yrs.	15	Factory	Full Week	No	No[c]	100
Marion	Y	Y	Y	Y	...	...	No	No	7 to 10 Yrs.	8	Factory	Full Week	No	Yes	No
Vincennes	Y	Y	N	Y	Y	Y	No	No	4 to 30 Yrs.	4 to 30	Factory	Full Week	No	Yes	.....

State and City	Do You Have a Man to Service Each of the Following, or Does One Man Do All Service? (Y=Yes; N=No; ...=No Reply)						No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
	Controls	Stokers	Oil Burners	Filters	Motors	Cleaning	One Man Does All Service	Do You Do Service Work Yourself?	How Long Has Your Service Man Worked for You?	How Many Years' Experience Has He Had?	Has He Had Any Special Training? (Note A)	Does Service Man Devote Full Time to Service?	Is There a "Service Pool" in Your City?	Have You Had Service Men Deferred?	How Many Heating Plants Can One Man Service?
IOWA														
Cedar Rapids	N	N	N	N	Y	Y	No	Yes	10 Yrs.	10 & 20	None	Full Week	No	No	.....
Davenport	Y	Y	Y	Y	Y	Y	No	.....	.....	....	.....	.....	.....	.....	.....
Davenport	N	N	N	N	N	Y	Yes	Yes	.....	....	.....	.....	No	Yes	.....
Des Moines	N	Y	Y	N	N	N	No	.....	1 to 10 Yrs.	....	.....	Full Week	No	No	.....
Marshalltown	Y	Y	Y	Y	Y	Y	No	.....	Several	Several	Yes	Full Week	No	No	.....
Mason City	N	N	N	N	N	Y	No	Yes	.....	....	.....	Full Week	No	No	No
Mason City	Y	Y	Y	N	Y	Y	Yes	No	21 Yrs.	10	Yes	Full Week	No	No[c]	No
Sioux City	N	Y	N	N	N	Y	No	.....	5 Yrs.	....	.....	.....	No	No[c]	.....
Sioux City	Y	Y	Y	N	N	Y	Yes	Yes	2 Yrs.	6	None	Full Week	No	No	.....
Spencer	N	Y	Y	N	N	N	.....	Yes	.....	....	.....	.....	.....	.....	.....
Waterloo	N	N	Y	Y	Y	Y	Yes	No	.....	....	.....	.....	No	No	No
Waterloo	N	Y	Y	N	N	Y	No	No	1 to 20 Yrs.	1 to 20	Factory	Full Week	No	Yes	400
Webster City	Y	Y	Y	Y	Y	N	No	Yes	7 to 18 Yrs.	7 to 18	None	Full Week	No	No	Yes
KENTUCKY														
Lexington	Y	Y	Y	Y	Y	Y	Yes	Yes	3 Yrs.	3	Radio	Full Week	No	Yes	1,000-1,500
Louisville	Y	Y	N	Y	Y	Y	Yes	No	16 Yrs.	25	None	Full Week	No	No	Yes
MASSACHUSETTS														
Boston	N	N	N	N	N	Y	.....	.....	.....	....	.....	.....	No	No[c]	.....
North Scituate	N	N	Y	N	N	Y	Yes	No	15 Yrs.	15	Factory	Full Week	No	Yes	500
Worcester	N	Y	Y	N	N	N	No	No	8 Yrs.	15	.....	Full Week	No	Yes	?
MICHIGAN														
Ann Arbor	Y	Y	N	N	N	Y	No	Yes	4 Yrs.	4	Control	Full Week	No	No	Yes
Battle Creek	Y	N	Y	N	N	N	Yes	.....	1 to 15 Yrs.	....	.....	Full Week	No	Yes	.....
Dearborn	Y	Y	Y	Y	Y	Y	No	No	6 to 14 Yrs.	12 to 20	Factory	Full Week	No	No	400-500
Detroit	N	N	N	N	N	Y	Yes	Yes	8 Yrs.	15	None	Full Week	No	No	No
Detroit	N	N	Y	N	N	N	Yes	Yes	4 Yrs.	8	.....	Full Week	No	.....	?
Escanaba	N	Y	Y	N	N	Y	No	Yes	3 Yrs.	3	None	Full Week	No	No	?
Flint	Y	Y	Y	N	N	Y	No	Yes	10 Yrs.	20	None	Full Week	No	No	?
Flint	N	Y	Y	N	N	N	Yes	Yes	5 Yrs.	15 or 20	None	Full Week	No	No	No
Grand Rapids	N	N	N	N	N	Y	No	Yes	.....	....	.....	.....	No	.....	.....
Highland Park	Y	Y	Y	Y	Y	Y	No	Yes	3 to 7 Yrs.	14	None	Full Week	No	Yes	300
Kalamazoo	N	N	...	N	N	Y	Yes	Yes	7 Yrs.	7	None	Full Week	No	Yes	.....
Kalamazoo	Y	Y	Y	Y	Y	Y	No	Help	10 Yrs.	10	Factory	Full Week	No	No	.....
Lansing	Y	Y	Y	Y	N	N	Yes	Help	3 Yrs.	4½	Factory	Full Week	No	Yes	600
Midland	N	Y	Y	N	N	Y	No	Help	1-2-5 Yrs.	1-3-10	None	Full Week	No	Yes	No
Muskegon	N	N	N	N	N	Y	No	No	25 Yrs.	25	None	Full Week	No	No	?
New Buffalo	N	N	N	N	N	Y	Yes	Yes	.....	....	.....	.....	No	No	.....
Saginaw	Y	Y	Y	N	N	Y	Yes	Help	12 Yrs.	5	.....	Full Week	No	Yes	300
Saginaw	Y	Y	Y	Y	Y	Y	No	No	10 to 20 Yrs.	10 to 20	None	Full Week	No	Yes	666
Sebewaing	Y	Y	Y	N	N	Y	No	Help	11 Yrs.	11	.....	Full Week	No	.....	300
MINNESOTA														
E. Grand Forks	Y	N	Y	Y	Y	Y	No	No	3 & 5 Yrs.	10	None	Full Week	No	Yes	300
Minneapolis	Y	N	Y	Y	N	Y	No	.....	7 Yrs. Av.	10	C	Full Week	No	Yes	?
Tracy	Y	Y	Y	N	N	Y	Yes	Yes	3 Yrs.	3	None	Full Week	No	No	100
MISSOURI														
Joplin	Y	N	N	N	N	N	Yes	No	2 & 8 Yrs.	24, 32, 35	None	Full Week	No	No	200
Kansas City	N	N	N	Y	N	Y	Yes	No	.....	....	None	.....	No	No	700-800
Kansas City	Y	Y	Y	Y	N	Y	No	Yes	1 Yr.	15	None	Full Week	Yes	No	400-500
St. Louis	Y	Y	N	N	Y	Y	No	Yes	4 Yrs.	20-25	None	Full Week	No	No[c]	.....
St. Louis	N	N	N	N	N	N	No	No	7 & 12 Yrs.	....	None	Full Week	No	No	.....
St. Louis	Y	Y	Y	Y	N	Y	No	No	6, 9, 14, 17	....	Factory	Full Week	No	Yes[c]	.....
MONTANA														
Great Falls	Y	N	N	Y	Y	N	Yes	Help	3 Yrs.	10	C; Gas	On Call	No	No	?
NEBRASKA														
Lincoln	N	Y	Y	N	N	Y	Yes	No	10 Yrs.	10	None	Full Week	No	Yes	.....
Lincoln	N	Y	N	N	N	Y	.....	Yes	10 Yrs.	8	None	Full Week	No	No	.....
North Platte	Y	Y	Y	Y	N	Y	No	No	4, 11 & 30 Yrs.	4, 11, 30	None	Full Week	No	Yes[c]	?
Omaha	N	N	N	N	N	Y	Yes	Yes	.....	....	.....	.....	No	.....	.....
Omaha	Y	Y	Y	N	N	Y	Yes	Help	1 to 12 Yrs.	1 to 12	None	Full Week	No	No	700
Omaha	Y	Y	Y	Y	N	Y	No	.....	12 Yrs.	12	Factory	Full Week	No	Yes	.....
Scottbluff	Y	N	Y	Y	Y	Y	No	Help	2 Yrs.	5	None	Full Week	No	Yes	400
NEW HAMPSHIRE														
Manchester	Y	Y	N	N	Y	Y	No	.....	5 Yrs.	10	Various	Full Week	No	Yes	400
NEW JERSEY														
Bogota	Y	N	Y	Y	Y	Y	No	Help	5 Yrs.	20	None	Full Week	No	No	No
Penns Grove	Y	Y	Y	Y	Y	Y	Yes	Yes	.....	....	.....	.....	No	Yes	300
NEW YORK														
Buffalo	Y	N	Y	Y	Y	N	Yes	Help	5 Yrs.	10	None	Full Week	No	No	.....
Buffalo	N	N	N	Y	Y	Y	No	Help	.....	....	.....	Full Week	No	Yes	.....
Corning	N	Y	Y	N	N	Y	Yes	.....	20 Yrs.	17	.....	Full Week	No	Yes	.....
Elmira	N	N	Y	N	N	Y	No	Help	3 Yrs.	3	None	Full Week	No	No[c]	.....
Kingston	N	N	Y	N	N	Y	Yes	Help	9 Yrs.	9	None	Full Week	No	No[d]	?
Newburgh	N	N	N	N	N	Y	No	.....	1, 20, 30 Yrs.	....	None	Full Week	No	No[c]	.....
Olean	N	N	Y	N	N	Y	Yes	.....	.....	....	.....	Full Week	No	.....	.....
Rochester	N	N	N	N	N	Y	Yes	Help	2 Wks.	20	None	Full Week	No	Yes	.....
Rochester	N	N	N	N	N	Y	No	Yes	6 Mos.	20	None	Full Week	Yes	Yes	250-400
Rochester	Y	Y	Y	Y	Y	Y	No	Yes	7 Yrs.	7	None	Full Week	.....	Yes	.....
Syracuse	N	Y	Y	Y	Y	Y	No	No	10 to 18 Yrs.	....	None	Full Week	No	No	500

State and City	Do You Have a Man to Service Each of the Following, or Does One Man Do All Service? (Y=Yes; N=No; ...=No Reply)						No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
	Controls	Stokers	Oil Burners	Filters	Motors	Cleaning	One Man Does All Service	Do You Do Service Work Yourself?	How Long Has Your Service Man Worked for You?	How Many Years' Experience Has He Had?	Has He Had Any Special Training? (Note A)	Does Service Man Devote Full Time to Service?	Is There a "Service Pool" in Your City?	Have You Had Service Men Deferred?	How Many Heating Plants Can One Man Service?
NORTH DAKOTA														
Minot	N	Y	N	N	N	Y	Yes	Yes	.....	....	.....	.....	No	.....	200
Wahpeton	N	Y	Y	Y	N	Y	No	No	22 Yrs.	22	Factory	Full Week	No	.....	Yes
OHIO														
Ashland	Y	Y	N	Y	N	Y	.....	Yes	6 Mos.	6 Mos.	None	Full Week	No	No	.....
Barberton	Y	N	N	Y	N	Y	Yes	.....	15 Yrs.	6	None	Full Week	No	No	No
Big Prairie	N	Y	N	N	N	Y	Yes	Yes	.....	....	.....	.....	No	No	.....
Canton	Y	N	N	Y	N	Y	Yes	.....	.....	....	.....	.....	No	.....	.....
Cleveland	Y	Y	Y	Y	Y	Y	No	No	4,10,13,18 Yrs.	5-10	Factory	Full Week	.....	Yes	1,000
Columbus	Y	Y	N	Y	Y	N	No	No	8 Yrs.	8	None	Full Week	No	Yes	1,500
Columbus	Y	Y	N	N	Y	N	No	No	3 Yrs.	10	None	Full Week[b]	No	No	Yes
Columbus	Y	Y	N	Y	N	Y	Yes	No	10 to 20 Yrs.	25	None	Full Week	No	No	500-1,000
Dayton	N	N	N	N	N	Y	Yes	Yes	3 Yrs.	35	None	Full Week	No	No	No
Dayton	N	N	Y	N	N	N	No	.....	.....	....	None	Full Week	Yes	Yes	250
Dover	Y	N	N	Y	N	N	Yes	Help	8 Yrs.	6	None	Full Week	No	Yes	No
Findlay	Y	Y	Y	Y	Y	Y	Yes	Help	12 Yrs.	6-7	None	Full Week	No	No	.....
Greenville	N	Y	N	Y	N	Y	Yes	Yes	.....	....	.....	.....	No	.....	.....
Hamilton	Y	Y	Y	Y	Y	Y	No	No	5 Yrs.	15	None	Full Week	No	No	.....
Lakewood	Y	N	N	Y	N	Y	No	No	17 Yrs.	....	Factory	Full Week	No	No[c]	?
Mansfield	Y	Y	N	N	N	Y	No	Help	1 Yr.	3	None	On Call	No	No	.....
Middletown	Y	N	N	N	N	Y	.....	Yes	.....	....	None	On Call	No	.....	.....
Ravenna	Y	N	N	Y	N	Y	No	No	10 Yrs.	10	None	Full Week	.....	.....	.....
Sandusky	Y	Y	Y	Y	Y	Y	Yes	No	20 Yrs.	20	Factory	Full Week	.....	No	250
Sidney	Y	Y	Y	Y	N	Y	.....	Yes	.....	....	.....	.....	No	Yes	No
Springfield	N	Y	Y	Y	N	Y	No	.....	10 Yrs.	10	.....	Full Week	No	Yes	100
Toledo	Y	Y	Y	Y	Y	Y	No	.....	3 to 20 Yrs.	5	Factory	Full Week	No	Yes	?
Youngstown	Y	N	N	Y	N	Y	No	Help	15 Yrs.	20	None	Full Week	No	No[c]	300
OKLAHOMA														
Oklahoma City	Y	N	Y	Y	N	Y	Yes	.....	18 to 30 Yrs.	18-30	.....	Full Week	No	No[c]	.....
Tulsa	Y	N	N	Y	Y	Y	Yes	No	5 Yrs.	10	None	Full Week	No	Yes	200
PENNSYLVANIA														
Clearfield	Y	Y	Y	Y	N	Y	No	No	5 Yrs.	10	Factory	Full Week	No	No[c]	300
Corry	Y	Y	Y	Y	Y	Y	Yes	Help	1 Yr.	20	Htg.	Full Week	No	No	500
Erie	Y	N	N	Y	N	Y	No	No	4 Yrs.	6	None	Full Week	No	Yes	400
Latrobe	Y	N	N	Y	N	Y	Yes	Help	10 Yr. Av.	17	None	Full Week	No	No[c]	.....
Meadville	N	Y	Y	Y	N	Y	No	No	4 Yrs.	12	None	Full Week	No	Yes	.....
Mechanicsburg	N	Y	Y	N	N	Y	Yes	Yes	.....	23	.....	.....	.....	.....	.....
Pittsburgh	Y	Y	N	N	N	Y	No	No	15 Yrs.	15	Factory	Full Week[b]	Yes	No	?
Pittsburgh	Y	Y	Y	...	Y	Y	No	No	15 Yrs.	20	Elect.	Full Week	No	Yes	No
Pittsburgh	Y	N	N	Y	Y	Y	No	Help	4 Yrs.	4	None	Full Week	No	Yes	300-500
Rimersburg	Y	Y	N	Y	Y	Y	No	Help	13 Yrs.	30	Eng.	Full Week	No	No	200
Tarentum	Y	Y	N	Y	N	Y	Yes	Help	4-6-8 Yrs.	4-8	.....	Full Week	No	Yes	?
SOUTH DAKOTA														
Rapid City	N	Y	N	Y	N	N	Yes	.....	7 Yrs.	10	.....	Full Week	No	Yes	.....
Yankton	Y	Y	Y	N	N	Y	.....	Yes	.....	....	.....	.....	No	Yes	No
TEXAS														
Dallas	N	N	N	N	N	Y	No	No	1 to 5 Yrs.	7	.....	Full Week	No	Yes	?
Houston	Y	N	N	N	N	N	Yes	No	2 to 6 Yrs.	2-20	Factory	Full Week	No	Yes	No
San Antonio	N	N	Y	N	N	Y	Yes	.....	4 Yrs.	4	None	Full Week	No	Yes	?
VERMONT														
Lyndonville	Y	N	Y	Y	N	N	Yes	.....	10 Yrs.	25	None	Full Week	No	No	.....
WASHINGTON														
Seattle	Y	Y	Y	Y	N	Y	No	.....	4 Yrs.	25	.....	Full Week	No	Yes	1,000
WEST VIRGINIA														
Morgantown	Y	Y	N	Y	N	Y	No	No	5 to 8 Yrs.	....	None	Full Week	No	No	.....
WISCONSIN														
Beaver Dam	Y	Y	Y	Y	Y	Y	Yes	Yes	.....	....	.....	.....	No	No	.....
Jackson	N	Y	Y	Y	N	Y	Yes	Help	8 Yrs.	8	None	Full Week	No	Yes	.....
Madison	Y	N	Y	N	Y	Y	No	Help	4 Yrs.	6	Elect.	Full Week	No	Yes	350-400
Milwaukee	N	N	N	Y	N	Y	Yes	Help	3 Yrs.	5	None	Full Week	No	Yes	?
Milwaukee	Y	Y	Y	Y	Y	Y	No	Help	3 Yrs.	8	Elect.; Htg.	Full Week	Yes	Yes	150
Milwaukee	Y	Y	Y	Y	N	Y	Yes	Help	22 Yrs.	22	Factory	Full Week	?	No	?
Oconomowoc	Y	N	Y	N	N	N	.....	Yes	.....	....	.....	.....	Yes	Yes	.....
Rhinelander	Y	Y	Y	Y	Y	Y	Yes	Help	8 Yrs.	15	None	Full Week	No	Yes	1,000
Shawano	Y	Y	Y	Y	N	Y	Yes	No	6 to 15 Yrs.	....	.....	Full Week	No	Yes	.....
Superior	N	N	Y	Y	N	Y	Yes	.....	15 Yrs.	15	Tech.	Full Week	No	Yes	.....
Two Rivers	Y	Y	Y	Y	N	N	No	Help	20 Yrs.	20	.....	Full Week	No	No	Yes
Waukesha	N	N	Y	Y	N	Y	Yes	Yes	2 Yrs.	30	None	On Call	No	No	No
Wausau	Y	Y	Y	Y	N	Y	Yes	Help	9 Mos.	2	None	Full Week	No	Yes	.....
WYOMING														
Sheridan	N	N	N	Y	N	Y	Yes	No	24 Yrs.	24	None	Full Week	No	Yes	.....

NOTE A—Elect. means training in electrical work; Htg. means heating engineer; Comb. means combustion analysis; Eng. means Engineering; Tech. means technical training; Factory means factory or jobber school; C means controls; Gas means gas equipment.

[b]—Part time, plus.

[c]—Employees are over draft age.

[d]—Employee was rejected.

CONTRARY to Mark Twain's quip on the weather — most (84 per cent) warm air furnace dealers seem to be selling and servicing filters (Column 2 in the Study below), but only a few dealers are advertising a filter service for a fixed sum (Column 3) as they advertise furnace cleaning.

That there is a tremendous field for more flat sum (Column 3) advertised filter services is indicated, it would seem, by the surprisingly few cases in which such a service is offered.

This Study shows, we believe, that American home owners are now aware of the healthfulness of cleaned air and appreciate that clean filters are the only way by which this desirable function of winter air conditioning can be obtained — this is the only explanation to the surprising number of filters carried in stock by dealers (Column 7).

Column 7 shows that 143 dealers reported an AVERAGE of 147 filters carried in stock. Note how many dealers carried hundreds of filters in stock. No doubt many of these dealers re-stocked more than once in a year. Using a rough average of three filters to a furnace, this average of 147 filters carried in stock will permit our average dealer to install at least 49 sets of new filters from stock. Since filters have been easy to get, it is possible that many dealers install more than 50 sets of filters in a year's time.

Although Column 3 shows few dealers advertising filter service at a fixed sum, Column 4 shows a surprising uniformity in charges for labor and Column 5 shows a fairly uniform charge for each filter.

In future issues American Artisan will publish details of several interesting filter services reported.

FILTERS

State and City	Do You Service Filters?	Do You Offer a Special Flat Sum Filter Service? How Much? What Do You Do?	If You Charge by the Job, How Much For? Labor—Per Hr. (Dollars)	Filters—Each (Dollars)	Do You Charge Mileage to and from Job?	How Many Filters Do You Carry in Stock?	Where Do Filter Calls Originate? (Percent) Home Owners	Commercial	Industrial
ALABAMA									
Montgomery	Yes	Yes[1]	$2.20	$.....	No	150	90	5	5
ARIZONA									
Phoenix	Yes	Yes	2.50	.....	.....	20	90	10	0
Tucson	Yes	No	2.50	1.00 up	No	300	90	10	0
ARKANSAS									
Paragould	Yes	No	1.50	.....	No	60	100	0	0
CALIFORNIA									
Eureka	Yes	No	2.00	.....	.06 mi.[5]	36	85	10	5
Oakland	Yes	.....	.....	List	.05 mi.	500	90	5	5
San Mateo	Yes	No	.....	1.75	No	20	70	20	10
CONNECTICUT									
Waterbury	Yes	Yes—$3.50 Set inst.	.....	1.50[9] up	1.00 up	100	95	5	0
DELAWARE									
Laurel	Yes	No	1.50	1.60	.05 mi.	150	100	0	0
ILLINOIS									
Bellevile	Yes	Yes	2.25	1.50	.....	300	80	10	10
Chicago	Yes	No	2.75	1.10	.10	1,000	10	60	30
Chicago	Yes	No	.....	.....	.....	Several Gr.	90	....	10
Elmhurst	Yes	No	.75[1]	1.75	.....	30	98	2	0
Forest Park	Yes	Yes—50c ea.[1]	.....	.....	.....	60	100	....	....
Highland Park	Yes	Yes	2.00	1.20 up	.....	144	90	9	1
Jacksonville	Yes	No	1.00	1.50	.....	50	100	0	0
Kankakee	Yes	No	2.00	1.50 up	.....	60	90	10	....
Lincoln	Yes	No	1.25	.....	No	48	90	10	....
Mattoon	Yes	No	.....	.....	.....	120	90	10	....
Moline	Yes	Yes	2.20	2.00	No	100	90	10	....
Naperville	Yes	No[9]	.....	.....	.....	150	90	10	....
Ottawa	Yes	.....	2.00	1.50	.....	144	100	....	....
Peoria	Yes	No	.....	.....	.....	15	90	....	....
Quincy	Yes	No	1.25	1.50	.10[5]	?	100	....	....
Rock Island	Yes	Yes[3]—1st yr. $2.30, $2.45 and $2.95; 2nd yr. $2.00 and $2.50.	.....	2.00 up	.....	....	....	....	....
Sheldon	Yes	Yes	1.00	1.50	.05	4	95	5	0
Wilmette	Yes	No	1st hr. 3.50; 2nd hr. 2.50	1.80	No	200	99	1	0

State and City	Do You Service Filters?	Do You Offer a Special Flat Sum Filter Service? How Much? What Do You Do?	If You Charge by the Job, How Much For? Labor—Per Hr. (Dollars)	Filters—Each (Dollars)	Do You Charge Mileage to and from Job?	How Many Filters Do You Carry in Stock?	Where Do Filter Calls Originate? (Percent) Home Owners	Commercial	Industrial
INDIANA									
Brazil	.....	No	.....	.....	.....	No	75	25	0
Columbia City	Yes	No	.....	1.50	No	No	85	10	5
Evansville	Yes	No	2.00	Cost + 25%	No	1 case	100	....	....
Fort Wayne	Yes	No	.....	.....	.....	144	95	4	1
Fort Wayne	Yes	No	No	1.50	.25	100	100	0	0
Fort Wayne	Yes	No	.....	List	.04	150	100	0	0
Hammond	Yes	No	2.00	?	No	12	95	5	0
Indianapolis	Yes	No	1.95	1.60	.06[5]	36	90	....	....
Lafayette	Yes	No	.....	.....	.....	Yes	100	0	0
La Porte	Yes	No[9]	1.50	1.50	No	144	100	....	....
Marion	Yes	No	1.50	1.50	.05[5]	125	75	10	15
Vincennes	Yes	Yes	1.50	1.25 up	.10[5]	50	50	25	25
IOWA									
Cedar Rapids	Yes	No	2.50	1.35	.....	24	90	5	5
Davenport	Yes	No	2.00	1.75	.....	24	90	10	....
Davenport	Yes	No	.....	.....	.....	30	90	10	....
Des Moines	Yes	No	.....	1.50	No	200	98	2	....
Marshalltown	Yes	No	.....	.....	.05	1,000	90	5	5
Mason City	Yes	No	1.75	1.50	.06[5]	50	95	5	0
Mason City	Yes	No	1.75	1.50	.05[5]	50	95	5	0
Sioux City	Yes	No	2.00	1.75	.....	24	100	....	....
Sioux City	Yes	No	1.75	1.75	.....	36	85	10	5
Spencer	Yes	.....	.....	?	?	30	100	0	0
Waterloo	Yes	No	2.00	.....	No	75	80	20	....
Waterloo	Yes	No	1.75	.....	No	150	90	8	2
Webster City	Yes	No	.....	.....	.....	5	85	....	....
KENTUCKY									
Lexington	Yes	Yes[2]	1.50	1.65	.10[5]	350	99	....	....
Louisville	Yes	No	2.00	1.45	No	Yes	100	0	0
MASSACHUSETTS									
Boston	Yes	No	.....	.....	.....	200	90	5	5
North Scituate	Yes	No	2.00	List	.....	250	99	1	0
Worcester	Yes	No	.....	.....	.05	....	80	....	20
MICHIGAN									
Adrian	Yes	No	2.50	1.65	.10	Yes	90	10	0
Ann Arbor	Yes	No	2.50	2.00	No	12	75	25	....
Battle Creek	Yes	No	.....	.....	.....	200	85	10	5
Dearborn	Yes	Yes—$1.75 trip[1]	2.50	1.50 up	No	100	80	10	10
Detroit	Yes	No	.....	.....	.....	36	....	....	....
Detroit	Yes	No[1]	.....	2.00	.....	25	100	....	....
Escanaba	Yes	No	1.50	1.50 up	.05[5]	48	80	15	5
Flint	Yes	No	2.00	1.75	No	180	90	10	0
Flint	Yes	No	2.50	.....	.10	38	90	10	0
Grand Rapids	Yes	No	.....	.....	.....	....	100	....	....
Highland Park	Yes	Yes—$4.50 + mat.[4]	2.50	1.50	.20	120	90	5	5
Kalamazoo	Yes	No	2.00	1.65	.05[5]	100	100	0	0
Kalamazoo	Yes	No	1.50	1.65	.05[5]	200	90	10	0
Lansing	Yes	Yes	.....	.....	.....	....	90	10	0
Midland	Yes	No	2.50	1.70	.25	150	90	10	0
Muskegon	Yes	Yes	.....	2.00 up	.05	1,250	95	0	5
New Buffalo	Yes	No	.....	2.50 inst.	.....	24	100	....	....
Saginaw	Yes	No	2.25	1.65	.05[5]	200	95	5	0
Saginaw	Yes	No	2.00	1.75	.....	88	90	5	5
Sebewaing	Yes	No	1.35	1.60 up	No	....	90	0	10
MINNESOTA									
East Grand Forks	Yes	No	1.25	1.50	No	60	98	1	1
Minneapolis	Yes	Yes	2.50	1.50	.05[5]	100	95	0	5
Tracy	Yes	No	1.25	1.50	.05	100	85	10	5
MISSOURI									
Joplin	Yes	No	2.00	1.75	No	96	80	10	10
Kansas City	Yes	Yes	.....	2.10	.....	Few	100	0	0
Kansas City	Yes	No	.25 ea.	.....	.....	200	90	10	0
St. Louis	Yes	No	.....	.....	.....	45	100	....	....
St. Louis	Yes	No	.....	1.75	No	144	80	5	15
St. Louis	Yes	Yes[6]	.....	1.50	No	175	75	15	10
MONTANA									
Great Falls	Yes	No	.....	.....	.....	100	90	10	0
NEBRASKA									
Lincoln	Yes	No	1.50	1.50 up	No	50	90	10	0
Lincoln	Yes	No	1.25	.....	.....	24	90	10	0
North Platte	Yes	Yes[7]	1.50	1.50	No	432	80	18	2
Omaha	Yes	No	1.50	1.50	No	12	85	....	....
Omaha	Yes	No	.....	.....	.....	120	95	....	....
Omaha	Yes	Yes	2.00	1.50 up	No	200	98	1	1
Scottsbluff	Yes	No	.....	List	.10[5]	50	90	5	5
NEW HAMPSHIRE									
Manchester	Yes	No	.....	.....	.....	63	33⅓	33⅓	33⅓
NEW JERSEY									
Hackensack	Yes	No	2.00	1.75	.....	50	80	10	10
Penns Grove	Yes	No	1.75	List[8]	No	0	100	0	0
NEW YORK									
Buffalo	Yes	No	2.00	1.50[7]	No[5]	100	15	50	35
Buffalo	Yes	Yes[2]	.....	1.50 up	.....	144	95	....	....
Corning	Yes	.....	1.50	1.50	.05[5]	36	100	0	0
Elmira	Yes	No	.....	1.50	.....	15	100	0	0
Kingston	Yes	No	.....	1.50	No	12	90	10	0
Newburgh	Yes	No	1.90 2.00	.....	.....	12	50	50	0
Olean	Yes	No	1.65	.....	.....[5]	144	90	10	0
Rochester	Yes	No	.....	.....	.10[5]	12	100	0	0
Rochester	Yes	No	2.40	1.50 up	.20[5]	24	50	10	40
Syracuse	Yes	No	2.00	Mfr. List	.....	72	100	0	0

State and City	Do You Service Filters?	Do You Offer a Special Flat Sum Filter Service? How Much? What Do You Do?	If You Charge by the Job, How Much For? (Dollars) Labor—Per Hr.	Filters—Each (Dollars)	Do You Charge Mileage to and from Job?	How Many Filters Do You Carry in Stock?	Where Do Filter Calls Originate? (Percent) Home Owners	Commercial	Industrial
NORTH DAKOTA									
Minot	Yes	No	1.50	2.00	.....	12	50	....	....
Wahpeton	Yes	No	1.50	List	.05[5]	24	100	0	0
OHIO									
Ashland	Yes	Yes[2]	.....	1.60	.05[5]	144	95	4	1
Barberton	Yes	.....	2.25	1.50	No	144	90	0	10
Big Prairie	.....	No	1.00	.....	.06	No	....	....	....
Canton	Yes	No	2.00	.....	.....	?	15	75	10
Cleveland	Yes	.....	.....	.....	.....	No (Jobber)	....	....	....
Cleveland	Yes	No ($1 to $5 Flat)	.....	1.50 up	Yes	200	90	5	5
Columbus	Yes	Yes[2] ($2.00)	.....	.....	.04[5]	1,000	95	5	0
Columbus	Yes	No[2]	.....	1.50 up	No	300	95	....	....
Columbus	Yes	No ($2.50 for inst.)	.....	1.50	No	750	100	0	0
Dayton	Yes	No	2.00	.....	No	None	100	0	0
Dayton	Yes	No	.....	1.50	.....	36	100	0	0
Dover	Yes	Yes[2]	.....	1.50	.06	48	100	0	0
Findlay	Yes	No	.....	.....	.10[5]	144	95	5	0
Greenville	Yes	.....	.....	.....	.....	Yes	98	....	....
Hamilton	Yes	No	.....	1.50	No	50	100	0	0
Lakewood	Yes	No[9]	.....	1.50	.....	350	100	0	0
Mansfield	Yes	Yes	.....	1.75	.....	50	90	9	1
Middletown	Yes	No	.....	.....	1.75	30	100	0	0
Ravenna	Yes	No	2.00	.....	.....	50	100	0	0
Sandusky	Yes	No	.....	.....	.....	30	85	5	10
Sidney	Yes	No	1.50	1.50	.10	36	80	10	10
Springfield	Yes	No	3.00	2.00	No	60	95	2.5	2.5
Toledo	Yes	Yes[2]	1st hr. 2.75; 2nd hr. 2.00	1.50 up	No	144	90	5	5
Youngstown	Yes	No[2]	2.30 up	1.10 up	No	50	85	10	5
OKLAHOMA									
Oklahoma City	Yes	No	2.50	1.50	.05[5]	144	85	10	5
Tulsa	Yes	No	2.50	2.00	No	100	95	3	2
PENNSYLVANIA									
Clearfield	Yes	No	1.60	.....	.10[5]	No (Jobber)	90	5	5
Corry	Yes	No	1.25	2.00 up	No	48	95	5	0
Erie	Yes	No	1.85	1.50	.05	25	90	10	0
Latrobe	Yes	.....	1.75	1.50	No	144	100	....	....
Meadville	Yes	No	.....	.....	No	Yes	100	....	....
Pittsburgh	Yes	No	.....	.....	.....	No (Jobber)	100	....	....
Pittsburgh	Yes	No	.....	.....	.....	100	95	5	0
Pittsburgh	Yes	Yes[2]	2.25; 3.50 min.	1.50	No	300	98	2	0
Rimersburg	Yes	No	1.25	.....	.10	No (Jobber)	100	0	0
Sharon	Yes	No	1.75	1.50	No	42	75	25	0
Tarentum	Yes	No	.....	1.50	Excessive	24	90	10	0
SOUTH DAKOTA									
Rapid City	Yes	No	1.50	1.50	.05[5]	36	90	10	0
Yankton	Yes	No	1.50	1.65	No	75	90	5	5
TEXAS									
Dallas	Yes	No	.....	.....	No	150	25	75	....
Houston	Yes	No	1.60	.....	No	2,160	10	70	20
San Antonio	Yes	No	2.00	.....	No	15	100	0	0
VERMONT									
Lyndonville	Yes	.....	1.00	.....	.08[5]	12	75	0	25
WASHINGTON									
Seattle	Yes	No	.....	1.50 up	.....	300	100	0	0
WEST VIRGINIA									
Morgantown	Yes	No	1.25	1.50	No	144	95	....	....
WISCONSIN									
Beaver Dam	Yes	No	1.00	.....	No	12	75	....	....
Jackson	Yes	No	1.40	.....	.10	75	95	....	....
Madison	Yes	No	.....	.....	.....	144	95	5	0
Milwaukee	Yes	No	2.25	1.50	No	30	100	0	0
Milwaukee	Yes	Yes[2]	2.25	1.50	No	150	80	15	5
Milwaukee	Yes	No	2.40	1.50 up	No	36	80	15	5
Rhinelander	Yes	.....	1.50	.....	.10	144	100	0	0
Shawano	Yes	Yes	1.20	1.50 up	No	50	60	20	20
Superior	Yes	No	2.00	.....	No	40	90	10	0
Two Rivers	Yes	No	.....	.....	.25	20	100	0	0
Waukesha	Yes	No	.....	.....	.10	24	....	....	....
Wausau	Yes	No	.....	.....	.....	48	90	10	....
WYOMING									
Sheridan	Yes	No[2]	2.00	List	No	25	98	2	0

[1]—Change filters.
[2]—Change filters, oil bearings, check belt and controls—general inspection—and clean.
[3]—Service three times a year—clean or replace filters, oil blower and motor bearings.
[4]—Service call gives party one hour labor on job.
[5]—Out of town or beyond reasonable distance.
[6]—Installed at dealer's convenience.
[7]—Delivered only.
[8]—Install filters and seal in place with tape.
[9]—Has over-the-counter business.

THE interesting fact disclosed in the Study on Blowers which follows is not that warm air heating dealers service blowers — we all know that — but the frequent reference in Column 3 to "bearings," "motor," "oil." What is needed in these calls for service is OIL. The Study seems to indicate that owners do not oil their blowers and the blower motor; whether they lack instruction, are too lazy, or just take operation for granted, we do not know.

No dealer reporting offers a special blower service. Some dealers combine blower service with filter service; some combine the blower with the advertised cleaning service on winter air conditioning systems; although very few dealers (Study to follow) offer any SPECIAL winter air conditioning service.

Almost no dealer repairs his own motors, but the number of motors carried as "spares" is far below normal stocks, indicating that the dealer is heavily dependent this year on either the manufacturer or some local motor repair shop for motor service. Since we are operating on such a small margin of safety on motor repairs, we should make some effort to keep motors in good service, perhaps some sort of instruction on blower care mailed to home owners with the dealer's imprint might save some service calls.

BLOWERS

State and City	Do You Service Blowers?	What Usually Is Wrong?	Who Rewinds Your Motors?	How Many Belts Do You Replace a Year?	How Many Spare Motors Do You Carry?
ALABAMA					
Montgomery	Yes	Motor or Control	Mfr.	12	6
ARIZONA					
Phoenix	Yes	Belts, Bearings Freeze, Short Circuit	Elect.	7	6
Tucson	Yes	Bearings Need Oil	Elect.	50	24
ARKANSAS					
Paragould	Yes	Noisy	Elect.	0	1
CALIFORNIA					
Eureka	Yes	Bearing	Elect.	2	2
Oakland	Yes	Belts or Filters	Ourselves	...	100
San Mateo	Yes	Bearings, Motor Needs Oil	Mfr.	1	1
CONNECTICUT					
Waterbury	Yes	Pulleys	Elect. & Mfr.	2	2
DELAWARE					
Laurel	Yes	Dirty Filters, Controls	Elect.	3	6
ILLINOIS					
Belleville	Yes	.....	Elect.	35	6
Bloomington	Yes	.....	Elect.	0	0
Chicago	Yes	Bearings	Elect.	50	Few
Chicago	Yes	Motor or Control	Ourselves	Few	10
Elmhurst	Yes	**Motor**	Mfr.	4	0
Forest Park	Yes	Noisy Bearings	Elect.	6	1
Highland Park	Yes	Vibration or Belt	Elect.	12	4
Jacksonville	Yes	Belt. Needs Oil	Elect.[1]	15	6
Kankakee	Yes	Needs Oil, Motor Burns Out	Elect.[1]	0	1
Lincoln	Yes	Dirty Filters	Elect.	10	4
Mattoon	Yes	Blades Loose, Noisy	Mfr.	4-8	6-8
Moline	Yes	Needs Oil, Filters	Elect.	6	4
Naperville	Yes	Oil, Belts, Filters	Elect.	6	3
Ottawa	Yes	Belts, Motors	.....	36	6
Paris	Yes	Motors	.....	....	2
Peoria	Yes	.....	Elect.	25	4
Quincy	Yes	Loose Bearings, Needs Oil, Filters	Elect.[1]	Not Many	....
Rock Island	Yes	Bearings, Filters	Elect.	30-50	2
Sheldon	Yes	Dirty Filters	Elect.	3	0
Wilmette	Yes	Bearings, Motor, Belt	Elect.[1]	24	15
INDIANA					
Brazil	Yes	Motor, Belt, Filters	Motor Repair	1	0
Columbia City	Yes	Motor, Pulleys	Elect.	0	0
Evansville	Yes	.....	Elect.	0	0
Fort Wayne	Yes	Belt, Motor, Oil Filters	Elect.[1]	12	12
Fort Wayne	Yes	Motor, Control	Mfr.	Few	0
Fort Wayne	Yes	Oil, Bearings	Elect.	50	4
Hammond	Yes	Oil	Elect.	6	0
Indianapolis	Yes	Belt	Elect.	Few	5
La Porte	Yes	Filters	Elect.[1]	25	1
Marion	Yes	Oil	Elect.	10	2-5
Vincennes	Yes	Fuse, Belt, Pulleys	Mfr.	6	8
IOWA					
Cedar Rapids	Yes	Bearings, Dirty	Elect.	3-4	0
Davenport	Yes	Bearings, Oil, Noisy	Elect.	12-20	4
Des Moines	Yes	Oil	Elect.	150	10
Marshalltown	Yes	Controls, Motors, Filters	Elect.	50	0
Mason City	Yes	Motors	Elect.	10	3
Mason City	Yes	Oil, Loose Wheel	Elect.	5	1-2
Sioux City	Yes	Filters, Control, Motors	Motor Repair	0	0
Sioux City	Yes	Pulleys	Elect.	0	2
Spencer	Yes	Dirty, Oil	Elect.	12	0
Waterloo	Yes	Dirty	Elect.	5	0
Waterloo	Yes	Filters, Motor Switch	Elect.[1]	200	10
Webster City	Yes	Oil	Elect.	Several	3

State and City	Do You Service Blowers?	What Usually Is Wrong?	Who Rewinds Your Motors?	How Many Belts Do You Replace a Year?	How Many Spare Motors Do You Carry?
KENTUCKY					
Lexington	Yes	Filters, Oil	Elect.[1]	20-30	10
Louisville	Yes	Motor	Elect.	5	0
MASSACHUSETTS					
Boston	Yes	Motor, Belts, Bearings, Control Settings	.....	12	4
North Scituate	Yes	Motors	Mfr.	12	4
MICHIGAN					
Adrian	Yes	Motor, Belts, Controls	Elect.	6	1
Ann Arbor	Yes	Motor, Oil	Elect.	10	0
Battle Creek	Yes	Motor	Elect.	....	4
Dearborn	Yes	Dirty Blades, Bearings	.....	200	50
Detroit	Yes	Motor Burns	Elect.	5	10
Escanaba	Yes	Oil, Belts	Elect.	10	2
Flint	Yes	Belt, Noise, Oil	Elect.	8	8
Flint	Yes	Dirty, Oil	Elect.	25	5-10
Grand Rapids	Yes	Motors	Elect.	0	3
Highland Park	Yes	Motor, Filters	Elect.	50	10
Kalamazoo	Yes	Bearings	Elect.	1	2
Kalamazoo	Yes	Dirty Filters	Elect.	3	10
Lansing	Yes	Oil, Filters, Motor	Elect.	Few	3
Midland	Yes	Bearings	Elect.[1]	20	10
Muskegon	Yes	Little Req.	Elect.	30-60	....
New Buffalo	Yes	Neglect	Elect.	2	1
Saginaw	Yes	Oil, Bearings, Vibration	Motor Repair	12	4
Saginaw	Yes	Oil, Bearings	Elect.	50	4
Sebewaing	Yes	Motor, Belts	Elect.[1]	6	3
MINNESOTA					
East Grand Forks	Yes	Filters, Motors	Elect.	12	3
Minneapolis	Yes	Bearings, Motor	Elect.	Seldom	6-12
Tracy	Yes	Oil Bearings	Mfr.	12	2
MISSOURI					
Joplin	Yes	Oil Bearings	Elect.[1]	2	2
Kansas City	Yes	Motor, Bearings	Mr.	....	2-3
Kansas City	Yes	Filters, Motor	Elect.	12-15	3-6
St. Louis	Yes	Motor, Belts, Oil	Motor Repair	40-50	6
St. Louis	Yes	.....	Mfr.	10-15	5-15
St. Louis	Yes	Loose Wheel, Pulleys	Mfr.	100	12
MONTANA					
Great Falls	Yes	Motors, Belts	Mfr.	50	6
NEBRASKA					
Lincoln	Yes	Bearings, Belt	Elect.	12	6
Lincoln	Yes	Oil, Filters	Elect.	12	0
North Platte	Yes	Pulleys, Loose Bearings	Elect.	10	5
Omaha	Yes	Oil	Elect.	12	0
Omaha	Yes	Bearings, Belts, Motors	Motor Repair	200	6
Omaha	Yes	Bearings, Motor	Elect.	10	12
Scottsbluff	Yes	Noisy, Vibration, Oil	Elect.[1]	15	4
NEW HAMPSHIRE					
Manchester	Yes	Loose Sheave, Bearings, Oil	Motor Repair	35-50	10
NEW JERSEY					
Bogota	Yes	Motor Burns Out	Mfr.	12	6
Penns Grove	Yes	Oil Bearings, Align Blocks	Elect.[1]	10	3
NEW YORK					
Buffalo	Yes	.....	Elect.[1]	6	6
Buffalo	Yes	Oil, Filters, Clean Scroll	Ourselves	25	10
Corning	Yes	Belts, Oil	Mfr.	6	2
Elmira	Yes	Motors	Elect.	4	2
Newburgh	Yes	Oil	Elect.[1]	5	0
Olean	Yes	Dirty	Elect.	Few	5
Rochester	Yes	Motor, Switches, Bearings, Filters	Elect.	....	2
Rochester	Yes	Motor Burns Out, Oil	Elect.	0	0
Rochester	Yes	.....	Elect.	1	0
Syracuse	Yes	Dirty, Motor	Mfr.	6	0
NORTH DAKOTA					
Minot	Yes	Oil, Filters	Elect.	10	2
Wahpeton	Yes	Dirty Filters, Motor	Elect.[1]	12	0
OHIO					
Ashland	Yes	Motor, Filters, Belt, Bearings	Elect.	1-2	1
Barberton	Yes	Oil, Belt	Elect.	25	4
Big Prairie	Yes	Noisy Bearings, Belts, Motor	Elect.	50	5-6
Canton	Yes	Varies	Elect.[1]	....	Varies
Cleveland	Yes	.....	Elect.[1]	2	0
Cleveland	Yes	.....	Elect.[1]	50	....
Columbus	Yes	.....	Elect.[2]	25	6
Columbus	Yes	Bearings	Elect.	5-10	Several
Columbus	Yes	Bearings, Motors	Elect.	15-20	12
Dover	Yes	Belts, Oil	Elect.	4	2
Findlay	Yes	Motor	Elect.	25	2
Greenville	Yes	.....	Elect.	0	1
Hamilton	Yes	Belts, Filters	Elect.	10	0
Lakewood	Yes	.....	Mfr.	5-10	2
Mansfield	Yes	Filters, Oil, Motor	Elect.	....	1
Middletown	Yes	Oil, Belt Tension	Elect.	....	3
Sandusky	Yes	.....	Elect.	6	0
Sidney	Yes	Oil	Mfr.	1	1
Springfield	Yes	Oil, Adjust Belt	Elect.	12	3
Toledo	Yes	Bearings, Belts	Ourselves[1 2]	200-300	40-50
Youngstown	Yes	Filters, Bearings, Motor, Controls	Mfr.	0	6
OKLAHOMA					
Oklahoma City	Yes	Loose Pulleys, Collars, Bearings	Elect.	100	7
Tulsa	Yes	Bearings	Elect.	20	6

State and City	Do You Service Blowers?	What Usually Is Wrong?	Who Rewinds Your Motors?	How Many Belts Do You Replace a Year?	How Many Spare Motors Do You Carry?
PENNSYLVANIA					
Clearfield	Yes	Dirty Filters, Oil	Elect.	4	2
Corry	Yes	Oil, Belt, Motor, Controls	Mfr.	2-3	2
Erie	Yes	Oil, Belt Stretched	Elect.	6	4
Latrobe	Yes	Oil	Elect.	2	2
Pittsburgh	Yes	Motor, Oil	Elect.	12	5
Pittsburgh	Yes	Oil	Elect.	0	6
Pittsburgh	Yes	Noisy, Dirty Blades	Elect.[1]	25	25-30
Rimersburg	Yes	Bearings Bad	Replacement	100	*12
Tarentum	Yes	Bearings Out of Alignment	.....	15	6
SOUTH DAKOTA					
Rapid City	Yes	Very Little	Elect.	0	0
Yankton	Yes	Vibration, Oil	Elect.	12	3
TEXAS					
Dallas	Yes	.....	Mfr.[1]	?	12
Houston	Yes	Bearings, Motor	Elect.	200	20-25
San Antonio	Yes	Dirty	Mfr.	3-4	5
VERMONT					
Lyndonville	Yes	Oil, Motor, Filter	Mfr.	....	2
WASHINGTON					
Seattle	Yes	Motor	Elect.	100	6
WEST VIRGINIA					
Morgantown	Yes	Out of Line, Belt, Bearings	.....	20% of Jobs	3
WISCONSIN					
Beaver Dam	Yes	Motor	Elect.	0	0
Jackson	Yes	Dirty, Bearings, Noisy, Vibration	Motor Repair	12	2-3
Madison	Yes	Belt, Pulleys	Elect.	10	4-6
Milwaukee	Yes	Motors, Filters	Elect.	Few	0
Milwaukee	Yes	Motor, Controls, Bearings	Elect.[1]	10	10
Milwaukee	Yes	Noisy, Belt, Control Setting	Elect.[1]	40-75	3-4
Rhinelander	Yes	Oil, Filters	Elect.	25	6
Shawano	Yes	Loose Pulleys	Elect.	6	4
Superior	Yes	.....	Elect.	3	2
Waukesha	Yes	Nothing	Elect.	....	1
Wausau	Yes	Oil	Elect.	1	2
WYOMING					
Sheridan	Yes	Broken Belt	Elect.	5	0

[1]Note 1—Send motor to motor manufacturer if inside the guarantee period.
[2]Note 2—Uses manufacturers exchange service whenever possible.
*When available.

Heat Input Should Be Based on Btu Loss [By S. Konzo]

IN the article by J. J. Cavellier on "Excess Air, Stack Temperature, etc.," on page 50 of the October AA, the author furnished a table suggesting a way to determine oil burner nozzle capacity for a warm air furnace based on the number of inches of leader pipe in the system.

Professor Konzo points out that leader pipe area may be misleading as a base from which to calculate nozzle size because:

"In the first place I assume that this applies only to gravity warm air furnaces. In the example cited, 500 sq. in. of leader pipe refers ordinarily to a 500 x 136 or 68,000 B.t.u. delivery at the register, or a heat loss from the house of the same amount. If we assume an overall efficiency of 65%, which is slightly less than that assumed for an oil designed job, we get a bonnet capacity of 68,000 ÷ 0.65 or 105,000 B.t.u. per hr. This is equivalent to about ¾ gallons per hr. Even if we assume a pick-up allowance of 25%, this brings the oil input rate to 1.25 × ¾ or less than 0.95 gallons per hr.

"Our tests have definitely indicated that it is highly desirable to not use an excessive oil input, since the flue gas temperatures increase tremendously with overfiring. In this particular example it would not be advisable to have an oil nozzle greater than 1 gallon per hr.

"If the house is of one-story construction and all the leader pipes go to the first story alone the heat loss from the house would be of the order of 0.82 of that given above, and the oil requirement would be even smaller.

"It is true that there are many non-code jobs in which the piping is inadequate, but these very jobs in which bottlenecks to air flow exist, are least able to handle excessive firing without damage to the furnace. The resulting register air temperatures, obtained when an excessive oil rate is used, are such that we have poor room temperature conditions in addition to poor efficiencies.

"I would like to recommend that in every case the heat input be based on the B.t.u loss of the house. The leader pipe rating is definitely deficient in that respect, since the relation between B.t.u. loss and the leader pipe size depends upon whether the house is built for one-story, 2-story, or combined story operation."

U. of I. Clinics To Simplify, Improve, Standardize Control and Humidity

IN AN effort to simplify, to standardize, to improve heating installations expected in the postwar period, the University of Illinois, Engineering Experiment Station, has begun the first of a series of "clinics" to which manufacturers of equipment involved and other interested individuals have been and will be invited.

Two clinics have been held to date—the Control Manufacturers Clinic on April 11 and 12 and a Humidity Clinic on April 13. Both clinics were held at the university, in Urbana, Ill.

The summary of the proceedings released by the National Warm Air Heating & Air Conditioning Ass'n is so interesting and timely that most of the summary is herewith published so that warm air furnace installers may know what is going on and add their ideas and suggestions to the already impressive beginning.

Control Manufacturers Clinic

The primary purpose of this meeting was to consider specifically the information required for Booklet 6 on Control Systems. Booklet 6 is one of the books now being written for use in vocational high schools, night schools, short courses, dealer training courses, and possibly, correspondence courses.

B. Recommendations to Furnace Manufacturers.

The following suggestions and recommendations by the control group were brought out in the discussion:

1. *Mixing of Controls.* The indiscriminate mixing of control units, particularly on the part of the dealer, has resulted in a large number of unnecessary complaints. This practice should be discouraged.
2. *Location of Bonnet Thermostat.* Due to differences in radiation, air velocity, and air temperature variations in the bonnet, it is considered desirable for the furnace manufacturers to not only definitely specify locations of bonnet thermostats, but to make provisions for such installations in each type of furnace.
   The suggestion that bonnet thermostats be definitely located on the *casing* of the furnace was not considered as generally practical although it could be done in some cases.
3. *"Pre-Wired" Controls in "Packaged Furnace" Units.* In certain units the assembly of controls in the "packaged furnace unit" has been accomplished, particularly in small-sized gas furnace units. Two limitations in the general application of this trend are:
   (a) Larger units have to be shipped "knocked down" and a shipping problem exists.
   (b) "Pre-wiring" of controls will not be feasible where electrical contractors' unions require a "dis-assembly" of such wiring.
4. *Control placements to be considered in Furnace Design.* The control group requested that furnace design engineers give consideration to the problem of control placement at an early stage of the design of a furnace unit. One representative stated that "the control man is the forgotten man" when furnace designs are being made.
5. *Ambient Temperatures Surrounding Controls.* The control group emphasized that existing controls are designed and manufactured for an ambient temperature surrounding the control of not to exceed about 165 Deg. F. In many designs where control units are located in panel housings, ambient temperatures in excess of this value are obtained with the net result that controls become overheated and lose effectiveness.
   The control group emphasized that controls can be manufactured for higher ambient temperatures, but that such controls will require special materials that will increase costs.

C. Recommendations to Control Manufacturers.

The research staff has taken the position that the continual thrusting of the blame for poor control installations and faulty adjustments on to the shoulders of the heating contractor is not entirely justified. The staff assumed the position of a "devil's advocate" primarily to bring out into the open some of the problems that perplex the installer, and to see if any practical solution is possible. The ultimate solution is dependent upon the mutual cooperation among control manufacturers, and also to a mutual cooperation between control and furnace manufacturers. The following items enumerate some of the subjects presented:

1. *Standard Control Systems.* In the Yardstick, two basically different control systems were recommended. The group reviewed the requirements and agreed that no change was necessary. (Page 10 Yardstick, System 1 and 2.)
2. *Limit Controls.* For both gravity and forced air systems, the use of a limit control was regarded as mandatory. Trouble due to temperature over-runs have been experienced when limit controls were omitted, or where the limit controls have been set far in excess above 200 deg. F. The furnace group requested that the top setting, or marking, of such limit controls be not in excess of from 200 to 250 deg. F. The control group brought out that in some cases of undersized distribution systems that excessively high bonnet temperatures have had to be maintained, and that a "control system is not a panacea for such ills in the heating plant."
3. *"Packaged Controls."* The more extensive use of complete control assemblies, or "packaged control assemblies" has been considered as desirable by the research staff. The troubles due to mixing of controls and of elimination of essential parts can to some extent be eliminated. It is possible that by this simplification some reduction in costs might be obtained.
4. *Control Panels.* In connection with "packaged control assemblies" some attention should be given to control panels, possibly with transformers and damper motors mounted on a panel and shipped out as a unit.
5. *Control Wiring Designation.* In the course of development of controls some practices "just grew." One of these is the designation used for wiring circuits. The terms "Series 20" and "Series 80" circuits are frequently referred to in control literature, and have a common trade acceptance. From the standpoint of the dealer, any move which would enable all control manufacturers to adopt and to use these designations without restriction would be desirable.
6. *Color Coding.* Another practice that is followed by a majority of production, but not by all, is the

color code used in 3-wire circuits. For example, the red wire is in a majority of cases used as a common wire. The fact that some manufacturers use another color for the purpose has proven extremely confusing to the installer. It is realized that any simplification of color coding will result in temporary hardships to some control manufacturers, but if an end result of more common acceptance of controls by installers is sought, then every little item that leads to confusion should be given serious study by the control industry. The Research Staff is in no position to demand standardization. They are, however, willing to serve the control industry in untangling some of these points, just as it has in the case of other segments of the warm air heating industry. If any change is to be affected, it should be done now when production is at a relatively low ebb, and before a large influx of new and inexperienced installers enters the field.

7. *Two-Speed Motors.* The more universal use of two-speed motors is stalled by the lack of uniformity in wiring of two-speed motors. Few ordinary electricians are in a position to understand the wiring requirements for various two-speed motors, when the motor manufacturers have no common practice. The entire group *unanimously* adopted a motion to the effect that this matter be brought to the attention of the motor manufacturers' group in the National Electric Manufacturers' Association for careful study.
8. *Simplicity.* A letter was read from a member of the Research Advisory Committee. The quotation below is self-explanatory and represents a view held by many furnace companies.

   "In the event that I am unable to get to the meeting I hope that you will tell them my story for me. I know that you understand the importance of continuous blower operation. You also understand that frequent cycling of the burner is necessary in order to level out the delivery of warmth when you are running a blower constantly. I think you also appreciate the desirability of extreme simplicity in controls and a minimum of adjusting and calibrating for the dealer to do in the basement. If you can steer these control manufacturers in this direction, you will have done our industry a great service."

   "Control manufacturers are interested, of course, in the sale of controls, and the more of these and the more elaborate they can make them, the greater their dollar volume. This is of no interest to the furnace industry. We have to service their darned controls. Therefore, I want them extremely simple, so that we will get the best results in the greatest number of cases. I am not interested in a lot of elaborate zone controls because there is not one dealer in 100 who understands them and can apply them to produce results as good as a simpler control system will give using the entire house as one zone. By the same line of reasoning, we have never promoted clock thermostats. While there is a lot in a clock thermostat that appeals to the homeowner, there is a service problem and an installation problem involved for the dealer."
9. *Nomenclature.* A basic requirement of any "science" is that a standard nomenclature be adopted in which each term is clearly defined. In the control industry, due to the use of a large number of trademarked designations, much confusion exists in the mind of the installer as to whether a particular product is, for example a limit switch or a fan switch. By common agreement among the representatives, the basic terms shown in Appendix B were accepted. The Association proposes to include in the Textbook all of these terms, *together* with a list of the trademarked names used by various control manufacturers. This information will be valuable as a cross reference. The control manufacturers are requested to send in their equivalent terminology for the items enumerated in Appendix B.
10. *Conventional Representation of Control Units.* For the purposes of the textbook, control manufacturers are requested to send in their suggestions for diagrammatic representation of such items as:
    a. Room thermostat
    b. Transformers
    c. Relays
    d. Gas valves
    e. Motors
    f. Conduit, etc., etc.
11. *Installation Instructions.* Control manufacturers are requested to send in their suggestions for installation of control units, for "do and don'ts" and for trouble shooting. Practical hints for the installer are urgently desired.

D. *Items for Research.*

During the discussion, some items that may have a bearing on development and research were brought forth as follows:

1. In many heating plants, the installed plant capacity seemed excessively high. Is the fault in heat loss calculations, in liberal use of factors of safety, in public demand for quick pick-up, or is it due to heat regain from smokepipe, chimney and casing?
2. Many ills of mal-distribution are expected to be corrected by use of controls. How can better design and installations of heating plants be obtained in the field?
3. Study should be given to future requirements brought about by postwar developments in such matters as panel heating, smaller and tighter house construction, ventilation, etc.

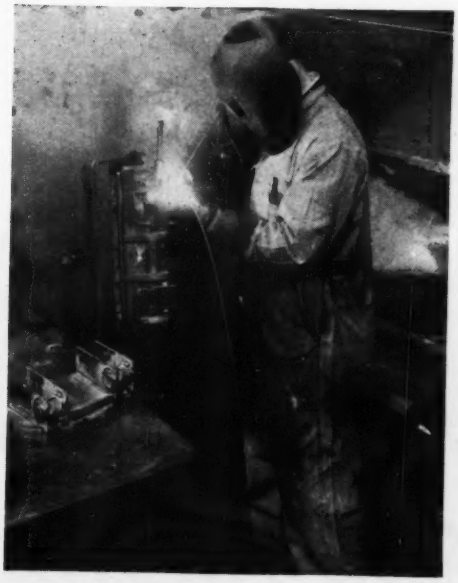
Humidity Clinic

1. Humidity manufacturers were organized as a group to meet together at a later date and to discuss problems of mutual interest. Mr. H. J. Carr was elected as chairman for the next meeting to be held on June 6, 1944 at the Stevens Hotel, at the time of the Association Convention.
2. A review was made of reasonable recommendations to be made with regards to desirable and practical humidities. Such factors as—
   1. Effect of humidity on comfort
   2. Effect of humidity on health
   3. Upper limitations of humidity as determined by building limitations
   4. Lower limits of humidity as determined by effects on furniture, presence of static electricity, and presence of dust in air
   5. Limitations determined by capacity of equipment

   And others—were brought before the group for consideration.
   Considerable information exists in the field on the topics enumerated, and all such references and data were to be collected, correlated and evaluated by the group.
3. In view of the numerous factors to be taken into account, the following recommendation was tentatively made:
   "Relative Humidities of from 25 to 40 percent in ordinary winter weather are generally considered practical. For temperatures of approximately zero to minus 10 deg. F. outdoors, the indoor relative humidity should not exceed approximately 25 per cent."
4. Following considerable discussion based upon calculated requirements as shown by existing data, the following tentative standards were adopted as the minimum water requirements for the following heat losses.

(*Continued on page* 114)

SHEET METAL SECTION



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Temporary Dies and Fixtures

(Forming Sheet Metal in Drop Hammer)

By Ernest E. Zideck
Sheet Metal Consulting Engineer

A ROPE-OPERATED drop hammer as shown in Fig. 1 of accompanying drawings can be constructed locally at no prohibitive cost and used to advantage in fabricating odd shapes, such as those having compound curvatures which otherwise would have to be formed by expensive dies in a drawing press. In preceding articles in the AMERICAN ARTISAN we have shown a great number of shapes which have been formed in the drop hammer. Soft annealed metals which it is possible to use in a draw press will form easily in the drop hammer. The hammer will form gauges from 24 to 11, depending on the nature of dies used for the work. The operation of forming sheet metal in the drop hammer does not differ much from the old-time practice of doing the work by "raising" hammers in a wood block. The difference obviously is in the speed by which parts can be produced by the older and the newer method.

The Drop Hammer

Although there are pneumatic and hydraulic drop hammers in use, the rope-operated type is still employed to a large extent because of its simplicity and cost of construction, and its adaptability to conversion to any kind of drop hammer work. Usually the rope-operated hammer has no larger capacity than 5 tons. For light work a 1-ton hammer will be sufficient. The bed in a 1-ton hammer is 30 x 36 inches. In the larger capacity, the bed can exceed 60 x 66 inches.

The hammer shown here consists of a concrete base (the concrete extending about 3 feet below the floor); of a cast iron block 8 x 36 x 42 inches mounted securely to the concrete base; of 4 five-inch diameter by 8 feet heavy wall, smooth pipes reaching through the block (I) into the concrete; a 6 x 40 x 48-inch cast iron top frame having 4-inch long sleeves receiving the posts; of the block (H) serving for the anvil; of block (M) formed to slide in between the four posts; of the die-punch (J), mounted to the sliding block (M); of the die (K) mounted to the anvil (H); of a heavy type rope (L) operating on revolving drum (D); of the motor (A), the clutch (B), the clutch release (F), and the spare rope drum (E).

The block (M) weighs one ton. Its weight can be increased by inserting additional weight on top of it. The sliding portions of the block are provided with bushings, so shaped that they hold in grooves within them a quantity of lubricant. The motor (A) runs continuously while the hammer is being operated, the operator manipulating the handle (F) of the clutch release. By releasing the clutch the drum (D) is disengaged from the motor and the block (M) drops down. An automatic clutch control permits the block (M) to ascend to a certain height, where it remains stationary until the operator releases the clutch by hand. The spare rope drum (E) holds a length of rope used to replace worn out portions as there is considerable wear on the active rope. This replacement is done by simply cutting off the worn portion of the rope and fastening the unused rope-end to the head (M). To protect the hammer falling down by inadvertently touching the release (F), there is a photo-electric cell arrangement provided which governs the release.

Drop Hammer Dies

The dies operating in a drop hammer can be a lead punch and zinc die. But these dies do not last long, especially if used for quantity production. Kirksite (an alloy of zinc, aluminum, copper and magnesium) gives better service, and the dies are much lighter, easier to handle in mounting. The punch (J) can be cast of lead to which about 8% antimony is added for hardness. But for continuous use Kirksite is the better die-material to use. There is now a new die material on the market for this purpose. It is called Terromatrix, can be cast at about 250 degrees and will not shrink in casting. For large production and heavy metal working cast iron or cast steel dies are in use, although they require accurate finishing after being cast oversize. For common work in the average shop Kirksite dies are best to use. In any of this work, plenty of lubricant (vegetable or lard oil) must be used to facilitate the movement of the sheet metal into the female die.

FIG. 1 DROP HAMMER ROPE OPERATED

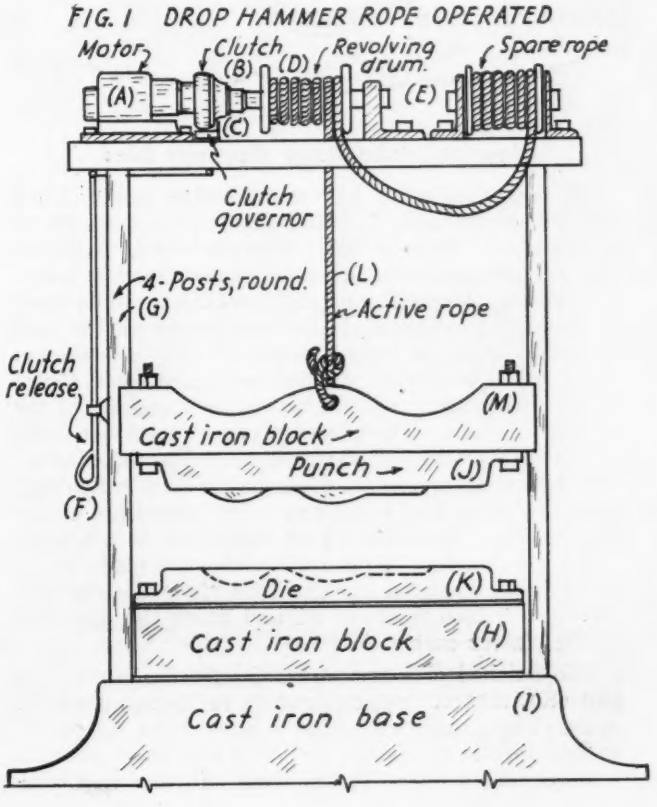
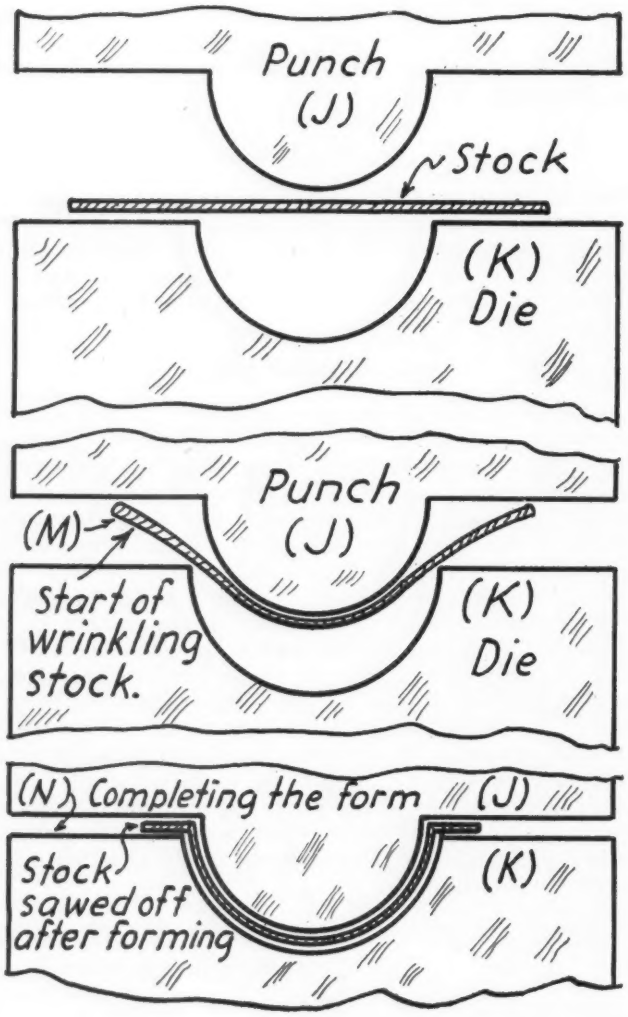


FIG.- 2
DROP HAMMER FORMING OF ELBOW - HALVES



How to Make Drop Hammer Dies

All cast dies must be cast oversize and finished afterwards by hand. Calculations as to shrinkages in die-materials named: lead, lead-antimony, Kirksite, etc., are obtainable in print. It is necessary to calculate the shrinkages beforehand, because template must be made to produce a plaster cast, to which the dies are made later. In brief, the procedure is as follows: (1) a set of templates of sheet metal are made, called "shrink templates," which embody the shrinkage of the casting in them. The pieces of the die set are sufficiently numerous and variated to guide the plaster-cast maker in his work, producing a cast which will have the form and depth and other essentials of the desired dies. Another set of templates is procured, called the "contour templates," which are made to the exact dimensions and contour lines of the desired dies. This set is used to shave off and finish the dies cast to the plaster cast.

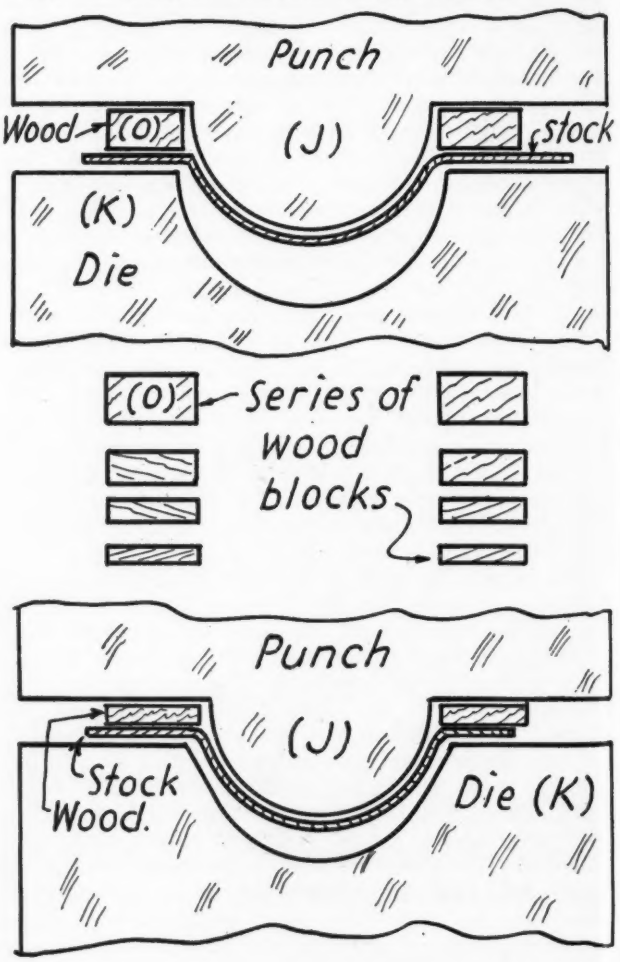
The finished dies are mounted onto the blocks (J) and (K), respectively, by from 5/8 to 7/8-inch diameter bolts. The punch (J) should have bolts 10 or 12 inches apart. As to the die (K), the latest practice is to provide a recess in the block (H), the die fitting into it, which dispenses with bolting the die to the anvil. The latest practice in mounting the punch (J) to the hammer (M) is to provide for a recess in the casting (M) into which fits the punch (J), with three 1-inch diameter cold rolled steel shafts inserted through holes provided for the purpose.

How to Prevent Excessive Wrinkling

The wrinkling of the sheet pressed into the form is today largely prevented by the use of wood-blocks illustrated in Fig. 3 of the drawings. In Fig. 2, showing the drop-hammer forming of elbow-halves, we see that the sheet commences wrinkling with the punch scarcely one third of its depth descended. Formerly, the sheet was taken out at this stage of forming and the wrinkles were reworked by mallet. This resulted in buckling and hardening the metal. A kettle with molten lead was kept near the hammer, the hardened metal piece dipped into the hot lead, and put back into the hammer in its hot condition. The next operation, again by only about one inch hammer descent, called for similar treatment of the wrinkled and hardened stock. Altogether, in deep and complicated formatures, the drop hammer practice has necessitated many repeated reworking by hand and soft-annealing of the part under formation.

The above drawback to hammer-forming has been largely eliminated by the use of what is called "Draw-Rings." These are nothing but wood-blocks sawed out

FIG.3
PREVENTION OF WRINKLES IN DROP HAMMERING



in the middle to fit over the punch (J). These blocks are made in series (as shown in Fig. 3), each block by about ½ inch thinner than the preceding. These wood-blocks are easy to interchange, in most cases just placing them over the punch (J), held to (J) by close fit and wedging. The wood-block will hold the sheet pressed against the top of die (K), the metal sliding from under the block as the punch (J) descends. Many variated-thickness blocks are used because each lesser thickness allows the punch to descend farther. In many cases ¼-inch or ⅜-inch thick plywood boards are used instead of the solid blocks. Wrinkles will still form in the sheet, but these will be slight, the next wood block straightening them out as a mallet would. These final wrinkles in most cases are flattened out by the final hits of the hammer against the sheet with no wood in-between. Where necessary, the kettle with the molten lead can be used to anneal the part partly formed and make the wrinkles give way under subsequent hammer beats.

Progressive Drop Hammer Dies

In deep and intricate formations it is advisable to use "progressive" dies. These consist of several punches (J) made each about ½ inch deeper than the last. The first few dies need have no accurate form and need not be finished by hand. Rough castings from the plaster cast may be used. Also, especially if the mounting of the punch is done by the insertion of shafts as described here, the dies can be changed without undue loss of time. If rubber is available, its use in this connection is of advantage, as it will prevent wrinkling of the stock in corners and small radius formatures. In absence of rubber (its advantage being that it does not deteriorate like plywood under hard pressures), steel rings may be used. These are hot rolled steel plates of about ¼ inch thickness sawed out (or flame-cut) to fit over the punch (J) as the wood blocks do. The steel ring is used principally before the "final" operation by the last punch takes place. The steel ring will serve in that the formed wrinkles in the stock will be straightened out to a great degree before the punch is allowed to hit directly against the part reposing on die (M).

Interchange of one steel ring and one plywood ring (called a ring although the shape of the punch might not be a ring), has proven to work better than if only wood pieces are used. The steel ring laying on the stock will prevent wrinkles burying themselves in the wood. And the wood is used to fill-in, making unnecessary the handling of heavy rings made of metal solely. Heavy lubrication of the sheet when steel rings are employed is necessary, to allow for the stock sliding under the ring.

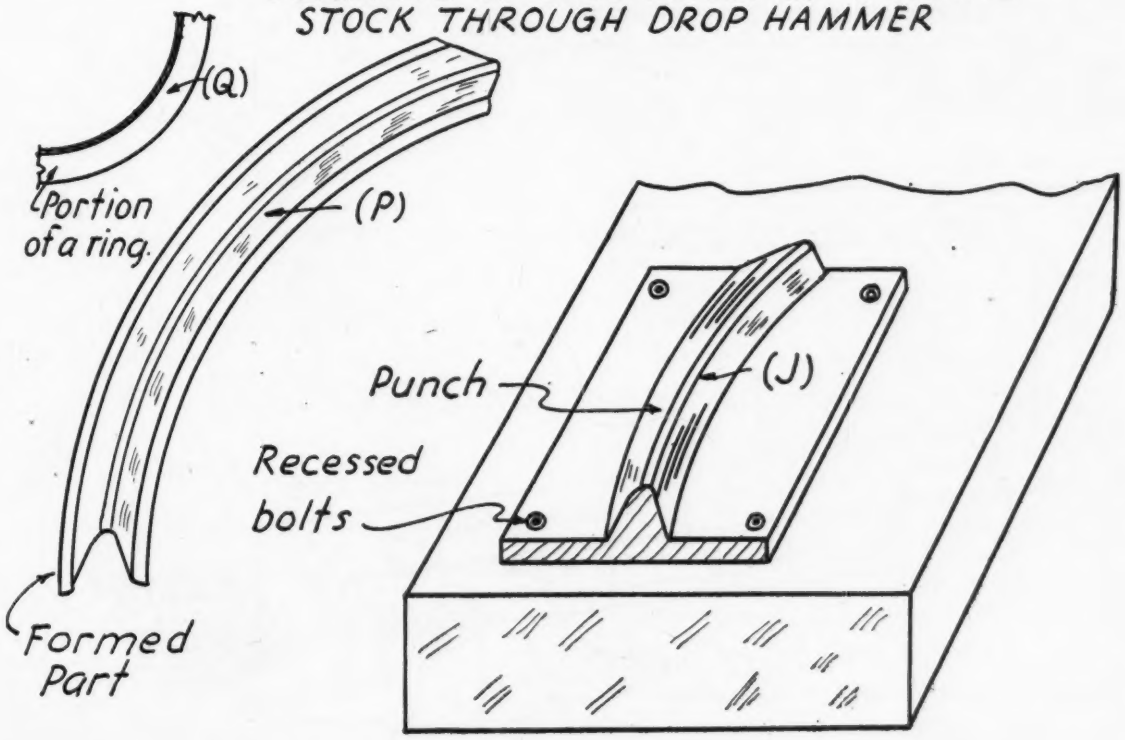
Use of the Feeder Die

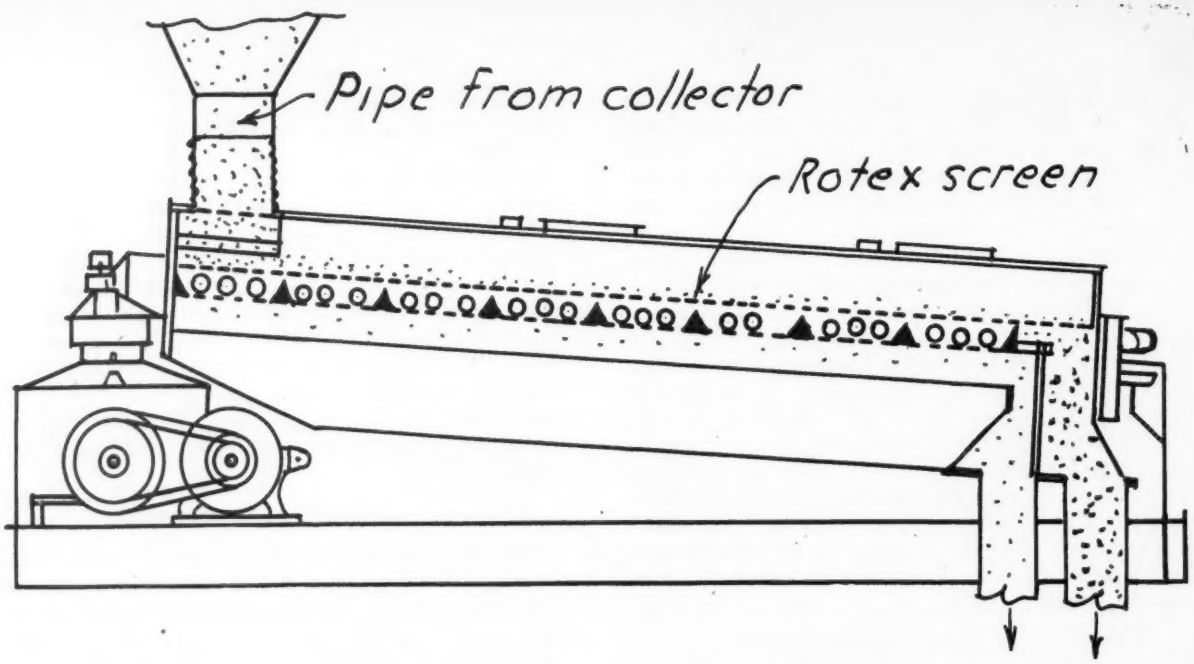
In Fig. 4 we show an arrangement for drop-hammer forming of long strips which cannot be placed in the dies at one time. The formed part shown under (P) indicates what the feeder die is used for. The strip of metal worked by these means is sheared to form, about 4 inches wider than the developed blank calls for. The punch (J) is here mounted on block (H) instead of on the hammer (M). The female die is mounted to the hammer. This arrangement permits the operator to hold the sheet-strip over the punch as needed. With the first indentation in the metal completed, the strip will slide along the punch (J), its weight downward, and the guiding of the part along the punch will be that much easier.

In this work the operator starts with the hammer descending about one inch over the top of the punch. He holds the one end of the strip over the punch, making a start about 6 inches long. The next hammer beat will pre-form another 4 or 5 inches, with the strip held in the position of the sheared form. By degrees and stages the whole length of the strip is preformed,

(*Continued on page* 110)

FIG. 4
FORMING OF LONG PIECES BY "FEEDING" STOCK THROUGH DROP HAMMER





Separating Dust from Shavings

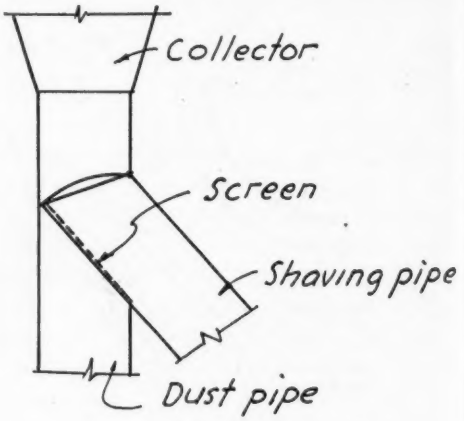
IN the December, 1943, issue we asked readers to suggest methods whereby dust can be separated from shavings in the same collector. In the February issue we showed a cyclone which is said will do the trick.

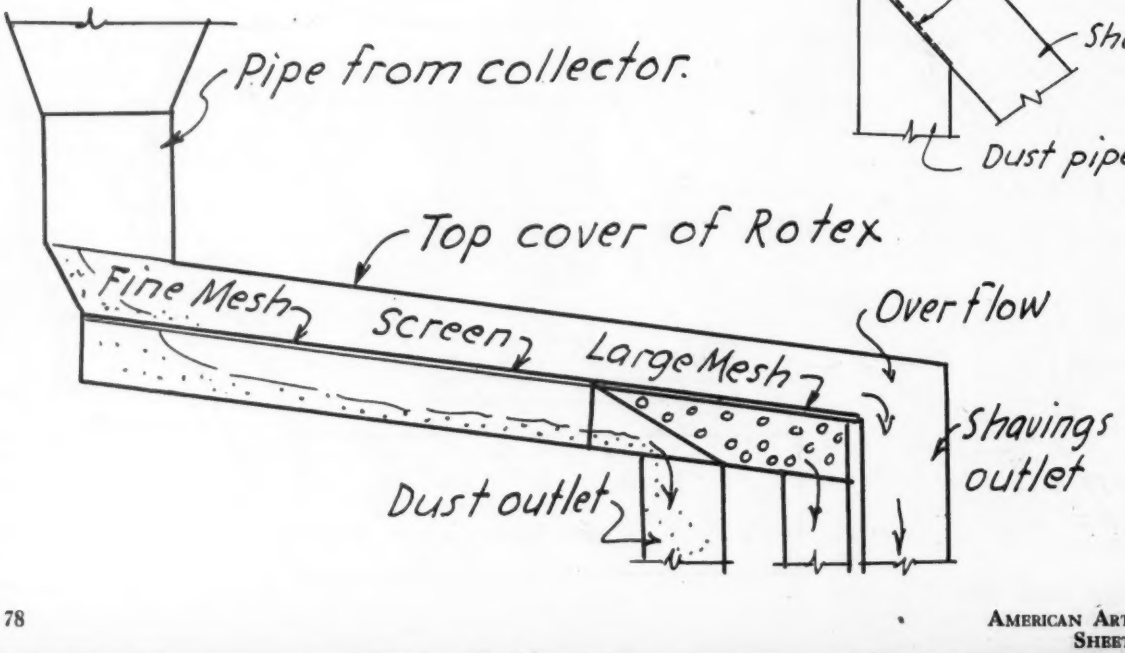
Now reader Peter J. Kecks of Pittsburgh sends a sketch and calls attention to a machine which will separate two materials, or three materials by degrees of fineness. Mr. Kecks says—

"Having worked for 15 years in a cork products plant where shavings and dust collectors were numerous, we still could not build a unit such as requested by your reader and I don't think it can be done. However, there are two ways to separate dust from shavings after they leave the collector. The first method is to have a screen under the collector outlet pipe to screen the coarse from the fine. The other method is far better—it employes a "Rotex" screen (Orville Simpson Co., Cincinnati)—and the results demanded can be accomplished. A drawing shows the general layout."

Editor's Note—The Orville Simpson Co. furnished us with a catalog showing different machines and the accompanying sketch was made to follow as closely as possible Mr. Keck's drawing.

Above—Diagrammatic sketch of "Rotex" separator. Below—Small sketch shows Mr. Kecks' suggestion for a screen in pipe and author's layout for a screen separator.





Refrigerant-Cooled, Spot-Welding Electrodes* [Part 3]

By Dr. F. R. Hensel,† E. I. Larsen,‡ E. F. Holt§

Heat Effects in Electrodes Resulting from Material Being Welded

In order to differentiate between the temperature attained in an electrode due to the conduction of heat from the material being welded and temperature resulting from heat due to the joule-effect in the electrode material, a series of continuous spot-welding tests were conducted on both water-cooled and refrigerant-cooled electrodes when welding 24 ST Alclad and when simply permitting the electrodes to butt together with normal current flowing. The test electrodes' design was then shown in Fig. 5. The test was conducted as follows:

1. Twenty continuous welds at a speed of 50 spots per minute were made while welding 24 ST Alclad.

2. Without removing from the machine the electrodes were cleaned using a flat electrode tip cleaner to provide a 3/16-in. diam. flat area on both faces. This was done by rotating the paddle cleaner between electrodes while under a light pressure. The welder was then operated in the normal continuous sequence with welding current flowing but without having any material between the electrodes. Temperature recordings were made through 20 continuous operations.

In Fig. 16 the test results on water-cooled electrodes are plotted. Tests made with and without welding are recorded on the same graph and it is evident that a considerable portion of the heat effects occurring in the electrode are due to the generation of heat by the welding current passing through the electrode material. From curve, Fig. 16, the maximum temperature with water cooling during the welding was 152° C., while without material being welded it was 102° C.

The results with refrigerant-cooled electrodes (see Fig. 17) indicate that the differential between the temperature maxima with welding and without welding are greater than with water cooling.

Deterioration of Spot Welding Electrodes

In spot welding of steel, stainless or other similar metals having relatively high hardness and strength, particularly at elevated temperatures, the electrode deterioration will occur principally through plastic deformation or "mushrooming" of the electrode face.

Mushrooming results in increased contacting area and decreased current pressure densities in the weld area. In time, therefore, with continued welding the weld strength will decrease below a minimum standard and the electrodes must be redressed to the original face contour.

In the spot welding of aluminum alloys having lower mechanical properties than the electrode

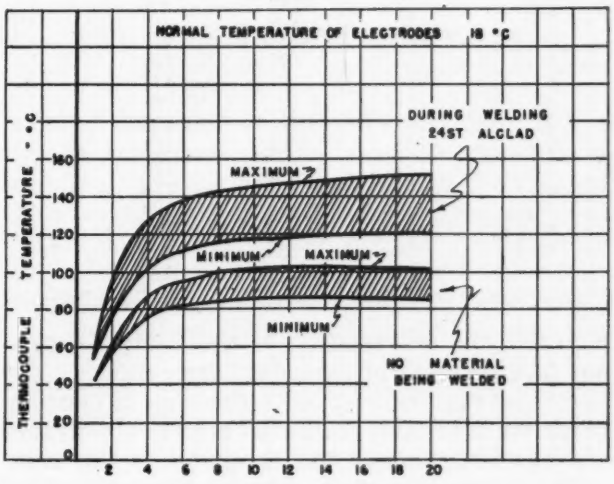


Fig. 16—Water-Cooled Electrodes, Tests A54 and A55

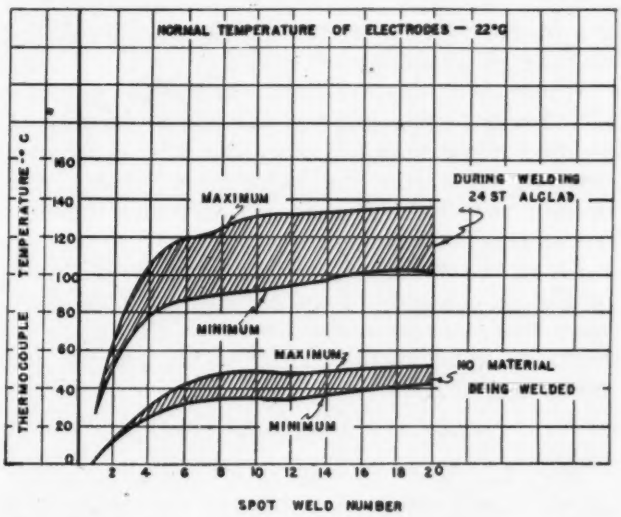


Fig. 17—Refrigerant-Cooled Electrodes, Tests A56 and A57

*Presented at the Annual Meeting, A.W.S., Cleveland, Ohio, Oct. 12 to 15, 1942.

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Table 9—Temperatures Attained at Thermocouple, °C.

Spot Weld No.	Water Cooled Electrodes Max.	Water Cooled Electrodes Min.	Refrigerant-Cooled Electrodes Max.	Refrigerant-Cooled Electrodes Min.
Normal	19	19	— 22	— 22
1	55	53	28	52
2	87	75	64	64
3	106	90	86	74
4	122	103	94	78
5	132	109	102	82
6	137	113	108	86
7	139	118	112	88
8	141	120	116	89
9	142	121	119	89
10	144	120	119	89
11	144	120	119	89
12	144	121	121	89
13	146	123	121	89
14	148	123	121	89
15	148	124	121	89
16	148	124	121	89
17	149	124	121	89
18	150	124	121	91
19	150	124	123	92
20	150		123	
(Twenty seconds interval before welding commenced on second strip)				
21	58	54	24	22
22	90	79	60	49
23	115	96	82	63
24	128	106	98	75
25	135	112	108	82
26	139	118	116	88
27	144	120	119	89
28	148	120	121	90
29	148	121	121	90
30	150	121	121	90
31	151	121	121	90
32	151	121	121	92
33	151	121	121	92
34	151	121	121	93
35	151	121	122	93
36	152	121	122	95
37	152	122	124	95
38	154	123	124	95
39	154	123	126	96
40	154	...	126	...

material, the deformation of the electrode welding face becomes of secondary importance. The electrodes require frequent redressing or cleaning to maintain suitable standards of weld appearance and avoid sticking of the electrodes to the work.

In one case, therefore, deterioration of the electrodes results from mechanical causes, while in the other case deterioration is due to chemical reasons. In both cases the rate of deterioration is a function of the temperature at the face of the welding electrode.

It is reasonable to assume that the maintenance of a lower temperature in the electrodes during welding would tend to reduce the rate of alloying between electrode and aluminum sheet, and thereby reduce the frequenty with which the electrodes must be cleaned.

Using the standard electrode design as shown in Fig. 5, a series of continuous welding tests were made to determine the rate or nature of electrode deterioration using water cooling and refrigerant cooling.

Deterioration at 50 Spots per Minute

Test A44 was run making a total of 40 welds on the same set of water-cooled electrodes at a rate of 50 spots per minute under the established welding conditions. At the 20th weld a 20-sec. interval before starting a second strip was allowed.

Test A45 was similar to the previous test, except a new set of electrodes was used and refrigerant cooled to a normal temperature of —22° C.

Temperatures attained in Tests A44 and A45 are tabulated from oscillograph recordings in Table 9.

Photographs of the water-cooled electrode from Test A44 are shown in Fig. 18, and the refrigerant-cooled pair from Test A45 are shown in Fig. 19.

The surface appearances of the spot welds were photographed and are listed as the following figures:

Fig. 20—20th weld in water-cooled test.

Fig. 21—40th weld in water-cooled test.

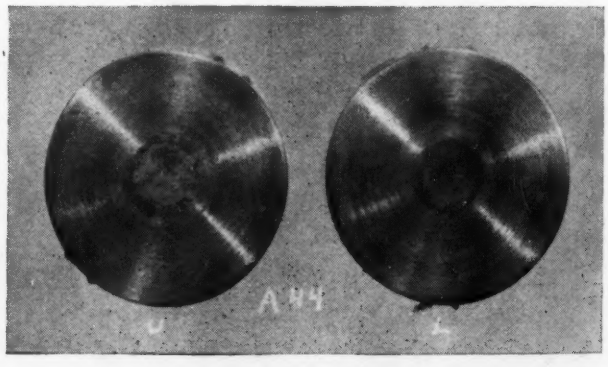
Fig. 22—20th weld in refrigerant-cooled test.

Fig. 23—40th weld in refrigerant-cooled test.

Examination of the electrodes revealed that the "pick-up" on the water-cooled electrodes is slightly more severe than occurred on the refrigerant-cooled pair. The appearance of the spot weld surfaces does not seem to have been materially improved by the refrigerant-cooled electrodes.

Incipient sticking of the electrodes to the aluminum sheet occurred at the 10th weld with the water-cooled electrodes and at the 13th weld with the refrigerant-cooled electrodes. Sticking became more severe as welding progressed, and more pronounced using water-cooled electrodes.

Fig. 18



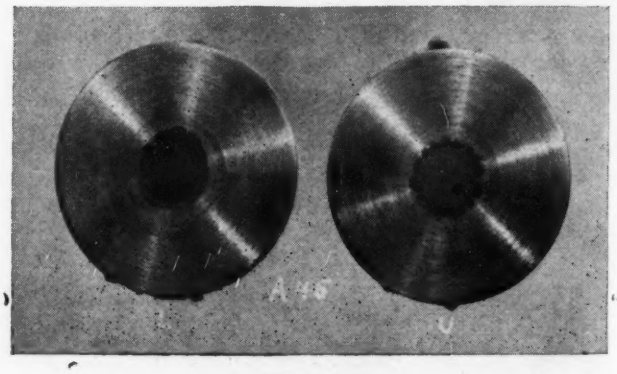


Fig. 19

Table 10

	Water-Cooled Electrode Tests			Refrigerant-Cooled Electrode Tests		
	A46	A50	A49	A47	A53	A52
Total number welds	25	50	100	25	50	100
Normal electrode temperature	20° C.	15° C.	15° C.	—23° C.	—28° C.	—27° C.
Recovery temperature	20° C.	18° C.	18° C.	—20° C.	—25° C.	—25° C.
Average time between welds	14.2 sec.	13.7 sec.	5.66	12.4 sec.	14.8 sec.	15.5 sec.
Average spot welds per minute	4.23	4.38	10.8 sec.	4.84	4.06	3.85
Incipient sticking occurred	9th	9th	12th	10th	12th	11th
Total number of sticks	16	41	88	11	20	69
Number sticks to lower electrode	6	0	2	3	9	45
Number sticks to upper electrode	10	41	86	8	11	24

For instance, no difficulty was experienced in welding at 50 spots per minute using the refrigerant-cooled electrodes. On the water-cooled run it was very difficult after about the 18th weld to keep the aluminum strip moving and the welds spaced properly. On about the 25th weld a double weld was made on the same spot because it was impossible to break the stick loose fast enough.

Sticking was more pronounced on the upper electrode. When sticking was definitely encountered on any particular weld, the electrodes in all probability stuck to both sides of the materials, but when the electrodes parted, the sheet adhered to the tip to which it was stuck more strongly.

Effect of Welding Speeds on Electrode Deterioration Rate

As a result of the tests just described it seemed that the maximum advantages which might be obtained with refrigerant cooling of electrodes would not be developed at rapid welding speeds. Therefore, a series of welding tests were made using water and refrigerant cooling at a rate of welding speed which allowed the electrodes to return to a normal temperature before each successive weld.

Three runs were made of 25, 50 and 100 welds for each type of cooling. The results of these experiments are tabulated in Table 10.

Incipient sticking occurred after about the same number of spot welds regardless of the type of cooling. However, the extent and severity of the sticking between electrodes and sheets were always more pronounced in the case of the water-cooled electrodes. The surface appearance of the spot welds did not seem to be greatly affected by different cooling methods.

In most of the tests the upper electrode deteriorated more rapidly than the lower electrode. However, no measurable skidding of the electrodes could be observed and temperature measurements indicated that both upper and lower electrodes operated at similar temperatures.

"Pick-up" and alloying of the electrode material occurred usually in the form of a concentric ring around the outer circumference of the flat area which developed on the electrode face during welding. The material eroded from the electrode face is deposited on the surface of the spot weld and is detected by proper etching. Disturbances in the microstructure of the weld were found corresponding to the ring formed on the electrode.

A comparison of Tests A44 and A45 carried out at a welding speed of 50 spots per minute with the latter tests in which temperature recovery was permitted before each weld indicated that a

Fig. 20

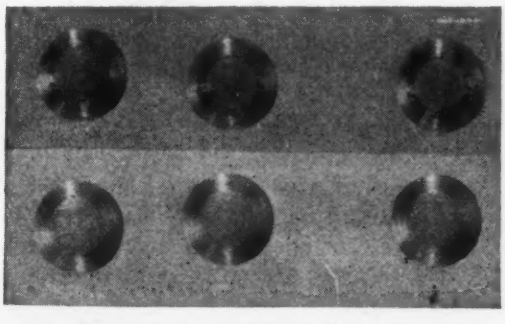


Fig. 21

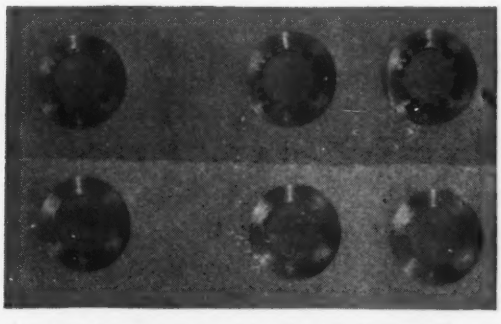


Fig. 22

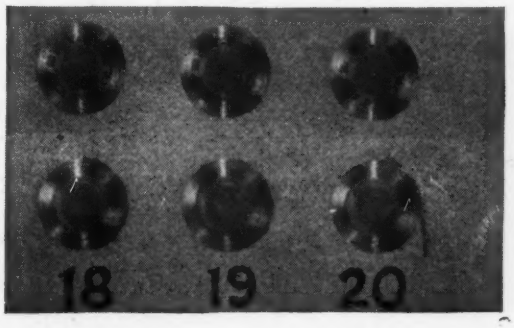
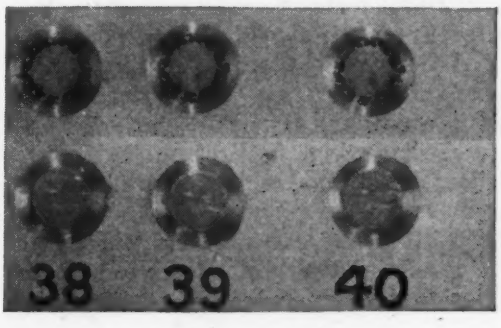


Fig. 23



decreased rate of electrode deterioration resulted when the electrodes were cooled to nomal temperature before each weld.

Effect of Squeeze Period Duration on Rate of Electrode Deterioration

Refrigerant cooling is of value only if it is possible to keep a superficial layer directly at or below the welding face of the electrode at a low temperature.

Table 11

Normal electrode temperature	—26° C.
Total number welds	50
Recovery temperature	—24° C.
Incipient sticking occurred	16th
Total number of sticks	18
Number sticks to upper electrode	15
Number sticks to lower electrode	3

If the sheet to be welded (which is at room temperature) is placed against the refrigerant-cooled electrode, an exchange of heat occurs between electrode and sheet which increases the temperature of the welding face of the electrode.

If the welder squeeze period is relatively short, the high thermal conductivity of the aluminum will result in a rapid exchange of heat to the electrode raising the temperature of the electrode face.

At the time of the initiation of the weld current the electrode face may be at a temperature high enough to offset any advantages the refrigerant cooling system might provide.

In Test A58 a series of 50 spot welds were made with long squeeze and hold periods, using refrigerant-cooled electrodes having a normal temperature of —26° C. The squeeze period was maintained sufficiently long to allow the face to recover temperature during the squeeze period and, also, to decrease the temperature of the aluminum strip under the electrodes to the electrode temperature, before the weld current was initiated.

The welder sequence was adjusted to the following:

Squeeze or delay period. 15 sec. (average)
Weld period..... 8 cycles
Hold period.....10 sec.
Welding speed..... 2 welds per minute

The results of the test are shown in Table 11.

It was found that sticking of the refrigerant cooled electrodes was decreased somewhat, both in severity and number of sticks because lower superficial surface temperatures were maintained.

Selective Deterioration of Electrodes

In practically all tests it was noted that electrode deterioration during welding was more pronounced on the upper electrode. Several probable causes of this preferential attack were investigated and it was found that the polarity of the electrode to sheet during the first one-half cycle of current flow determined which electrode would deteriorate more rapidly.

The effect of the electrode starting polarity on the relative rate of deterioration between either electrode was first expressed to the authors by C. C. Titherington of the Eastern Aircraft corporation.

The welding current timer used in our tests was a synchronous control which always initiated the current flow from a zero value. Moreover, the current is always initiated with the same polarity. Investigation by means of oscillograph recordings disclosed that the normal starting polarity occurring in the secondary circuit rendered the upper electrode anodic (positive) with respect to the sheet or lower electrode.

Continuous welding tests were made using both refrigerant cooling and water cooling in which the current was initiated with reverse polarity or making the upper electrode cathodic with respect to the sheet during the first one-half cycle of the current.

This effect was accomplished in the timer circuit by restricting the rate of voltage rise on the secondary circuit of the timer impulse or peaking transformer. This prevented the impulse voltage from overcoming the grid bias of the time-on start tube during the leading cycle but allowed the second half of the cycle to be pulled in.

With this reverse polarity starting, the selective deterioration was transferred to the lower electrode.

The transfer of the selective deterioration with reversed starting polarity, was very strongly marked and it is evident that the electrode that is anodic (positive) with respect to the aluminum sheet during the first one-half cycle of the welding current, deteriorates at a more rapid rate than does the opposite electrode. The selective deterioration results in the erosion of copper from the electrode face.

The possibility of electrolytic effects on the erosion is being studied.

Summary

While the present investigation has been confined to the spot welding of aluminum alloys with a specific electrode and holder design, it can be stated that definite benefits can be derived in standard a.-c. welding with refrigerant cooling. These benefits might be further enhanced by modifying the electrode design. The advantages of refrigerant-cooled welding electrodes used in conjunction with the stored energy welding processes should be studied. Test data so far available indicate that the beneficial effects of refrigerant cooling are more pronounced in this type of welding.

Acknowledgment

The authors wish to acknowledge the work of Mr. G. E. Korb, who carried out many of the welding tests, and the assistance of Mr. H. C. Apley for his work on the amplification system.

Appendix A

Refrigeration System for Artificial Cooling

A typical indirect refrigeration system was

(*Continued on page* 108)

Proper Use and Care of Paint Brushes

By Stanley C. Dingman

IN THE sheet metal industry the protection of surfaces with paint and similar coatings has become so much a part of most contracts that the paint brush has become as common a tool as the snips. Yet there are certain special skills which must be acquired in the care and use of paint brushes if the utmost service and economy are to be obtained from them. And right now these two considerations are highly important for the war has affected the production and use of paint brushes, just as it has seriously affected the production of food, fuel, and other human necessities.

Paint brushes, though actually manufactured here, are really the product of foreign countries. Even if the amount of shipping space available for the importation of brush bristles were not curtailed by the demands of war commerce, there would still be a serious lack of suitable bristles for brush manufacture. China has long been the most important supplier of such bristles, and since all her ports are in the hands of the enemy, there are no trade routes open by which she might ship her goods to this country. Yet, with all the hogs produced in this country, why is it that we cannot meet the needs of our own brush manufacturers? Whether it is the climatic conditions, the type of hog bred, the manner in which the pigs are raised or the age at which they are slaughtered is not definitely known, but American pigs do not produce the long, stiff, strongly-flagged bristles found on the semi-wild Chinese swine.

With the chief source of supply of good bristles thus cut off, and with no adequate substitutes yet discovered, Americans are faced with the necessity of learning how to prolong the life and serviceability of brushes. And the growing shortage of manpower is demanding greater production per available man. This means the selection of the proper brush for the job being done, the using of that brush so as to cover the greatest possible area in a given time, and the adequate cleaning and care of the brush when it is not in use.

Selecting the Proper Brush

The selection of the proper type of brush usually is not particularly difficult, as the shape and size of the brush usually suggests the purpose for which it is best suited. But one should not make the mistake of assuming that a job with large flat surfaces can always be done more quickly with the largest brushes, or with brushes having extra full stocks. Such brushes may be off balance and be more difficult to handle than a similar brush with less stock. The lighter, well-balanced brush actually may permit the covering of a larger area with greater speed and ease.

Flat surfaces should be painted with a flat, well-balanced brush with a full stock and long bristles. A brush, four to five inches wide and with bristles three and three-quarters to four and three-quarters inches long makes a good brush for such surfaces. Many painters recommend using an arc-like stroke with the brush held at a 45 degree angle with the surface. The arc-like swing allows a natural, easy arm motion that is least tiring and helps to eliminate visible stroke endings as the paint is blended off at the end of the stroke. When the overlapping stroke is started it, too, blends in with the paint already applied. The brush should be well filled with paint so that from one to two square feet can be coated before the brush needs to be filled again. Brush marks can be prevented by using a natural stroke that does not drag or work the paint too much. In this way, a sufficient amount of paint is left so that the coating flows into and fills the slight traces left by the brush. It is self-evident that if best results are to be expected, the brush bristles must be clean and pliable, for a brush with paint-stiffened bristles cannot lay the paint smoothly.

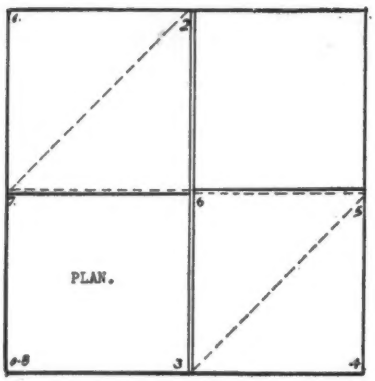
For varnishing or enameling broad surfaces, a chisel-pointed brush is most often used. Here again, a clean, pliable brush is a necessity if a first-class job is to be done. A great many painters prefer a round or oval brush for varnishing other large areas, and they recommend cross-brushing with the same brush. For final levelling and picking up in corners a flat, well-chiseled brush should be used. A brush about three inches wide with bristles about three and one-half inches long and with a full stock is suitable for this type of work as it holds a large supply of enamel or varnish and permits smooth stroking.

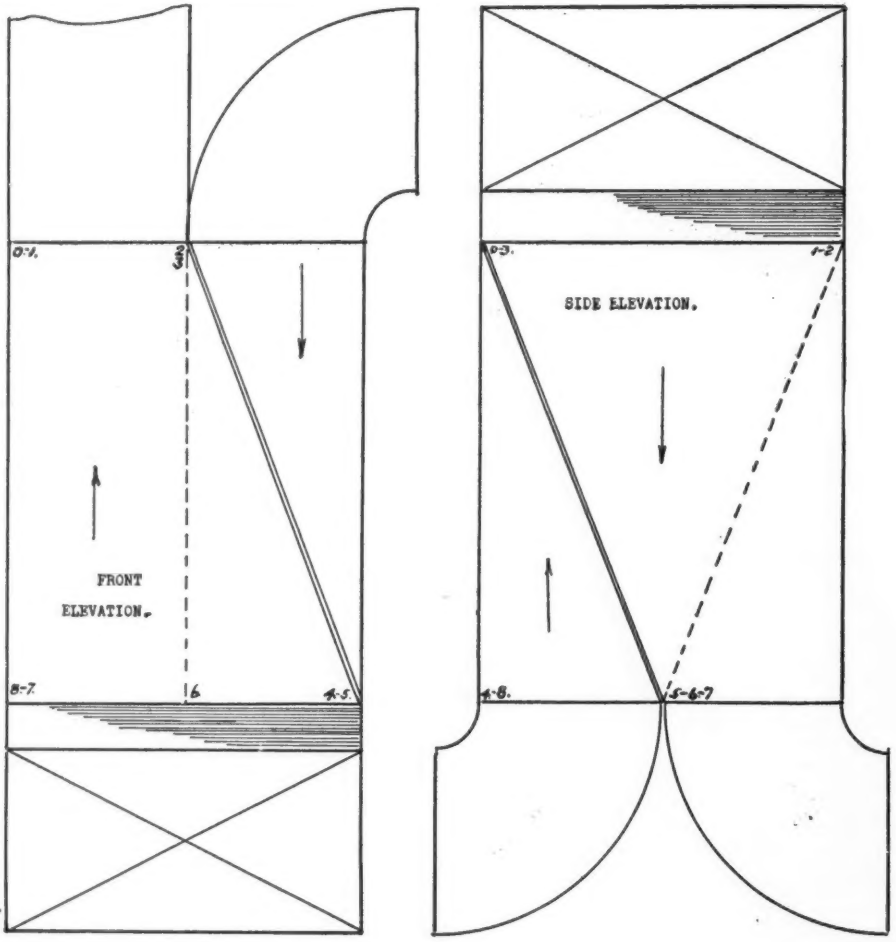
Flat, chiseled brushes are usually recommended for working paint into corners and over round, square, or beveled edges. The width and length of the brush will depend, of course, upon the size of the unobstructed flat surfaces to be coated. When working in any place where a narrow brush and short strokes are required, it is best to use a deeply chiseled, short-handled brush. A long-handled brush is a distinct hindrance in this kind of work because of the need for constantly changing the brush position. In places where the stroke can be longer and the surface to be painted is wider, a heavier, thicker brush can be used, and it will depend upon the painter's preference whether the handle is long or short. Neat tracing is impossible with worn, rounded brushes and consequently considerable time is required to remove excess paint from the window lights.

How to Use Brushes

To get the greatest possible coverage with the least work, it is important not only to select the proper brush for the job, but also to handle it properly. Trim tools, and similar brushes, should be gripped in much the same manner as a pencil, that is, with the handle between the thumb and index finger. The brush should make an angle of about 45 degrees with the surface being painted. Stand close enough to the work so that the arm may be comfortably flexed. Standing too close to, or too far from, the work unnecessarily

(*Continued on page* 112)





Rectangular Reversable Transition

By
Charles McGraw
Instructor,
Sheet Metal Work,
Alexander Hamilton
Vocational High School,
Brooklyn, N. Y.

THE problem: Two ducts, 24x48 inches, enter an opening, 50 feet square, and rise 60 inches, while doing so, the air within the ducts make a 90 degree turn.

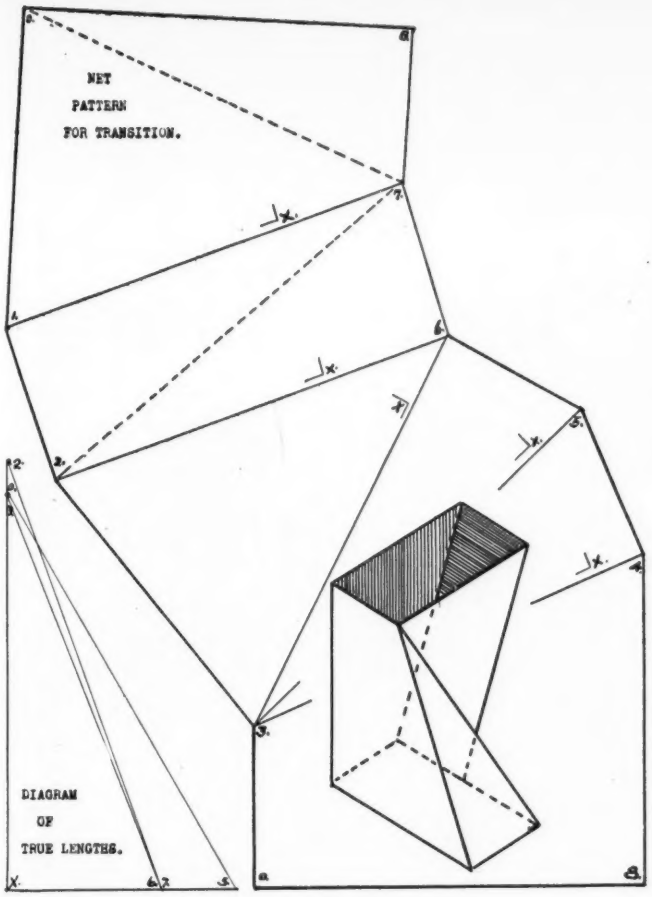
A close examination of the requirements necessary for the development of the patterns for the transitions shows the need for the development of the powers of visualization and initiative in arrangement and shape of transitions, keeping in mind the fact of maintaining full cross section area of each duct.

To aid in clearing any doubts as to practicability of the solution, a perspective is shown superimposed upon the pattern. It will then be seen that after making two fittings and reversing one, the two will nest together and will be ready to be bolted together and lowered into position on the job. For those inclined to burn the midnight oil:

Draw the plan, number all corners and bending lines; note in this case the corner opposite *0-8* has been purposely omitted for sake of clarity. Next project the elevations and number corners and bending lines to correspond with the plan.

Before the pattern can be developed it will be necessary to construct a diagram of true lengths, as follows: Draw a right angle indefinitely. Letter the apex *X*. Using the dividers, take distance *3-5* in plan, place it horizontally on the base line, measuring to the right from letter *X*. Number this point *5*. Take the distance *3-6* in the front elevation, place it on the vertical line measuring from the letter *X*. Number this point *3*. A slant line drawn from *5* to *3* will be the true length of line *5-3* shown in the plan.

Take distance *3-6* in plan, place it on the horizontal line measuring from letter *X*. Number this point *6*. Take the distance *3-6* in the front elevation, place it on the vertical line measuring from letter *X*. This



will coincide with point numbered *3*. A slant line drawn from *3* to *6* will be the true length of line *3-6* in plan.

Next take the distance *2-6* in plan, place it on the horizontal line measuring from *X*, which will coincide with point *6*. Take the distance *2-6* in the front elevation, place it on the vertical line measuring from *X*, which will coincide with point numbered *3*. A slant line connecting point *3* and *6* will be true length of line *2-6* in plan.

Take the distance *2-1* in plan, place it on the horizontal line measuring from *X*. Number this point *7*. Take the distance *1-7* in the SIDE ELEVATION (slant line), place it in the diagram of true lengths on the vertical line measuring from *X*. Number this point *2*. A line connecting point *2* and *7* will be the true length of line *2-1* in plan. Note here, line *1-2* in plan represents the top edge of a sloping side whose bottom edge is numbered *6-7* in plan, and this newly found true length line *7-2* represents a dotted line (not a bending line) running up diagonally across the sloping side from point *7* on the bottom edge to *2* on the top edge. This will be indicated in the pattern later. Further note, as an alternate, in finding the true length of this line, the distance *2-7* in plan, placed horizontally measuring from *X* and numbered *5*, and the distance *0-8* in the front elevation, placed on the vertical line measuring from *X*, could be used and by connecting points *5* and *0* will be equal to line *7-2* or the true length of line *2-7* in plan.

Next take the distance *0-7* in plan, place it horizontally in the diagram of true lengths, measuring from *X*, and number this point *7*. Take the distance *0-7* in the front elevation, place it on the vertical line measuring from *X* and number this point *0*. A line connecting *0-7* will be the true length of line *0-7* shown in plan.

To obtain the pattern it will simply be a matter of lifting the true lengths in the diagram, together with true lengths given in plan and elevations, and placing them in their proper relative position to each other, as follows:

Construct a trapezoid as shown by the numbers *0-8-4-3*, which is a duplicate of the flat side of the front elevation shown by similar numbers.

Set dividers to the true length distance *3-5*, in the diagram of true lengths, with one leg on point *3* of the trapezoid, scribe an arc. With dividers set to distance *4-5* in plan and one leg set on point *4*, scribe an arc intersecting the previously drawn arc. Number this point *5* and draw line connecting points *3-5-4*.

With dividers set to distance *3-6* in the true length diagram, place one leg on point *3* in the pattern and scribe an arc. Intersect this arc with dividers set to distance *5-6* in plan drawn from point *5* and number this point *6*. Draw lines connecting points *3-6-5*.

Set the dividers to distance *3-2* in plan, with one leg on point *3* of the pattern scribe an arc; intersect this act with dividers set to distance *6-3* in the true length diagram and with one leg on point *6*. Number this point *2* and draw lines connecting *3-2-6*.

With dividers set to distance *2-7* in the true length diagram, and one leg on point *2*, scribe an arc. Intersect this arc with another drawn from point *6* in the pattern set to the distance *6-7* of the plan. Number this point *7*. Draw lines connecting point *2-7-6*.

Set dividers to distance *1-2* in plan, with one leg on point *2*, scribe an arc, intersect this arc with dividers set to distance *1-7* in SIDE ELEVATION (slant line) and with one leg on point *7*. Number this point *1* and draw connecting lines *2-1-7*.

Set dividers to distance *0-1* in plan and from point *1* scribe an arc; set dividers to distance *0-7* in the diagram of true lengths and with one leg on point *7* scribe an arc, intersecting the previously drawn arc. Number this point *0* and draw lines connecting point *1-0-7*.

Set dividers to distance *7-8* in plan and with one leg on point *7* scribe an arc; next set dividers to distance *0-8* in the front elevation and with one leg on point *0* scribe an arc intersecting the previously drawn arc. Number this point *8* and draw lines connecting *0-8-7*, which will complete the pattern. Make two double seam or rivet corners and allowances for slip, or angle connection.

Surplus Government Property Sales

SURPLUS War Property Administration, announced May 23 that the War Production Board will cooperate with the procuring agencies of the armed services in disposing of property left over from terminated contracts. The board's 13 regional offices will endeavor to find buyers who are permitted under WPB regulations to purchase such surplus materials. Each regional office will have on file a list of property available in its territory and offerings will be made therefrom in conformity with the price policy recently established by the Surplus War Property Administration.

The materials to be listed with the War Production Board will consist of raw materials, semi-finished goods and scrap and will include steel, copper, aluminum, chemicals, textiles and lumber, as well as purchased parts and supplies.

82-Inch, 7 Section, 14-Ga. Elbow Welded Without Aligning Fixtures

The size of an 82-inch elbow is shown by comparison with the welder in the photo. The sketch below is only diagrammatic to show approximate final assembly of the elbow on the job.

THE accompanying photograph and sketch show an unusually large elbow fabricated by the Downey Heating Company, Milwaukee, for the Bucyrus-Erie plant in South Milwaukee.

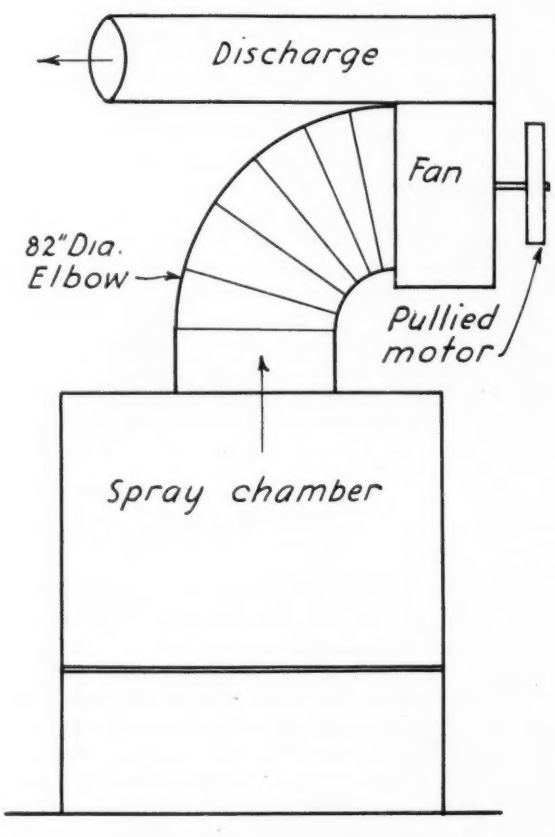
The material used is 14 gauge galvanized iron; the elbow is 82 inches in diameter and is used on a down draft paint spray exhaust. The sketch gives an idea of the application and installation. Some 5,000 cfm of air is exhausted through the floor gratings shown in the photograph, washed through water spray and discharged to the outside.

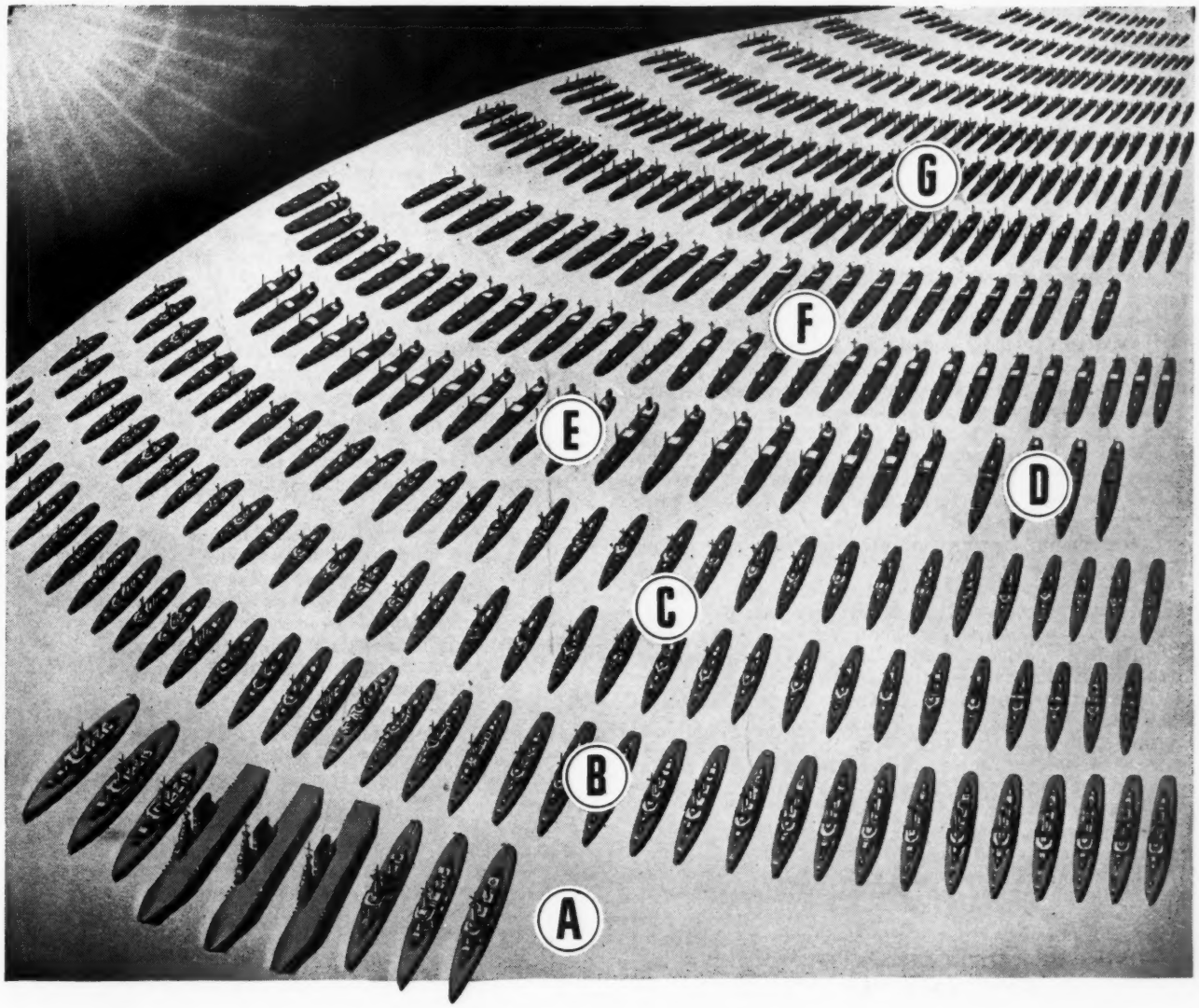
N. O. McCormick of the Downey company explains construction as follows:

"The segments of the elbow required 257.6 inches of material to make the circumference, therefore two 12-foot sheets were cut equally to length giving a seam at the widest part of each segment or at the extreme outer radius of the elbow. The seam in each segment matches that of the adjoining pieces giving the appearance of a continuous weld.

"The above cross welds were made first making each section form a ring. The lower tangent (the collar) was tacked down on a level steel table, the first segment was tacked to the tangent at intervals of about 8 inches and then butt welded for the circumference.

"The other segments were then tacked and welded in the same way until all seven sections were assembled to make the complete fitting standing as shown in the photograph. All that was necessary to line up the segments was to match up the already welded cross seams at the back. One welder completed the work calling for incidental assistance from men nearby when a section was to be held in place for tacking. Each segment weighed about 80 pounds."





The Fleet that Bethlehem built in '43

380 FIGHTING AND CARGO SHIPS

These ships equivalent in value to 1000 Liberty ships.

- (A) 3 Aircraft Carriers and 6 Cruisers
- (B) 37 Destroyers
- (C) 64 Destroyer Escorts
- (D) 4 Cargo Ships
- (E) 20 Tankers
- (F) 54 Landing Ships
- (G) 192 Liberty Ships

WORLD'S LARGEST SHIPBUILDER BETHLEHEM STEEL SECOND LARGEST STEEL PRODUCER

The Florida Annual Convention

THE annual convention of the Roofing and Sheet Metal Contractors' Association of Florida was opened with registration the morning of Friday, May 19th, in the lobby of the Suwannee Hotel at St. Petersburg.

This was the first meeting held since the 1942 Convention at Miami.

The weather was fair and considering travel restrictions the number of registrants was considered good. Sixty-nine people registered for the regular sessions and 46 registered for the banquet only. Twenty-two roofing and sheet metal shops, 9 manufacturers of roofing, steel, copper and clay tile and supply houses were represented.

The principal speakers at the meeting were Mayor George Patterson of the "Sunshine City," St. Petersburg; George Coit, War Production Board representative from Tampa; James McCawley, Executive Secretary of the United Roofing Contractors' Association; William Worsley, Manager of the Roofing division of Barret Co.; and Wm. Davenport, Manager of the St. Petersburg Chamber of Commerce.

At the first session of Friday morning the report of the Secretary-Treasurer, L. A. Burgess of West Palm Beach, was read. Greetings were received from national organizations, national publications and from members of the association who were unable to attend.

A committee consisting of Frank Tack, Clearwater, Chairman; Earl Linder of Miami, J. H. Van Hoy of Sanford and Jack Gross of West Palm Beach was appointed to prepare questions for the afternoon session with George Coit of the Tampa War Production Board Office as the speaker.

The nominating committee appointed by C. E. Brown, President, was as follows:

Chairman: R. E. Moorhead, Lake Wales
W. C. Kinsey, Miami
E. H. Hale, Fort Pierce

The convention committee for 1945 was as follows:

Chairman: Mack Fillingham, Jacksonville
Fred A. Falkner, Orlando
Ellard Kohn, Miami

The afternoon session on Friday was opened by an address of welcome by Mayor George Patterson of St. Petersburg.

George Coit of the Tampa office of the War Production Board outlined the regulations under which steel and copper may be purchased and spoke of the priorities under which shops may purchase supplies and operating materials. Many questions were asked and most of them were satisfactorily answered by Mr. Coit.

A committee was appointed to prepare a program for 1944-45. On this committee were Ellard Kohn, Chairman, Frank Tack, M. J. Strong and Earl Linder.

Following the afternoon session a tour of some of the shops in St. Petersburg was made.

In the evening two pictures were displayed to an appreciative audience. The first was a sound moving picture "To Each Other" shown through courtesy of Tennessee Coal, Iron and Railroad Co. and the second was "Big Inch," a sound technicolor picture shown by the Barrett Co. The two pictures were closely related as the first picture showed the manufacture of steel sheets, bomb shells, shells, and also pipe as was used in the "Big Inch" pipe line. The second picture showed the installation and wrapping of the line from the breaking of ground to the final covering of the pipe after laying.

The first speaker Saturday morning was James McCawley, Executive Secretary of the United Roofing Contractors' Association and Editor of the *United Roofer*.

He spoke of the effect of incendiary and other type bombs on the roofs in England and of his trip of inspection. At the close of his talk he recommended that the Florida shops should join the United Roofing Contractors' transportation of the materials. He gave interesting figures as to the extent of the built-up roofing industry.

The second speaker was William Worsley, Manager of the roofing division of the Barrett Co. His talk was about the supply of build-up roofing materials. He stated that since asphalt and pitch and felts were made as by-products or from waste materials there was an ample supply but that the difficulty arises in the packaging and transportation of the materials. He gave some interesting figures as to the extent of the built-up roofing industry.

A committee consisting of Fred A. Falkner, Wm. N. Palmer, and J. C. Caldwell was appointed to discuss with Mr. McCawley the subject of national affiliation.

Saturday afternoon the following 10 point program was presented by Ellard Kohn, Chairman of the committee. This program was adopted and the officers authorized to work toward the advancement of the program and the association.

1. To improve conditions in our own industry and render a greater service to the public
2. To aid in every way possible the war effort
3. Secure an interpretation and if necessary a correction of the mechanics' lien law
4. Simplification of priority regulation
5. Lower freight rates on roofing and sheet metal materials
6. Lower rates for Workmen's Compensation Insurance to be equalized with rates of other crafts of similar risks
7. Greater harmony between employer and employee
8. To require that contractors employing one or more workers be required to pay for Unemployment Insurance as well as those employing eight or more
9. Establish district chapters in all parts of Florida
10. Greater harmony between competitive firms in our line

Fred A. Falker reported that the committee on National affiliation could not decide that the Association should join either of the National organizations. The committee and the new officers were instructed to study the matter further and report at another convention.

After much discussion the membership dues for each shop were raised to $25 per year and for each Associate member to $25.

Another motion was passed giving the officers authority to spend the money for the furtherance of the 10 point program and to fix a salary for the Secretary-Treasurer.

The following were nominated and elected as officers for the new year:

President—Fred A. Falkner, Orlando
1st V. P.—C. E. Brown, St. Petersburg
2nd V. P.—E. H. Hale, Fort Pierce
3rd V. P.—M. J. Strong, Delray Beach
Sec.-Treas.—L. A. Burgess, West Palm Beach

Orlando was favored by the Convention City Committee and was named as the meeting place for 1945 convention which will be held in April or May.

In the evening approximately 120 attended the banquet at which the Mayor and City Council of St. Petersburg were guests. Wm. Davenport of the St. Petersburg Chamber of Commerce was the after dinner speaker and his talk which was 5 per cent serious and 95 per cent humorous was well received. Following the speech there was an excellent program of singing, dancing and a skating act. An orchestra provided music for dancing.

The local committee in charge of arrangements was S. L. Boyett, J. C. Pressley, Leo J. Freiburger, George A. Churchill, Otto Krauss and C. E. Brown.

L. A. BURGESS, Secretary-Treasurer,

ASSOCIATION Activities

Contractors' Alliance

The Air Conditioning Contractors' Alliance of Chicago, under plans of the new president, George Kalvog, will hold an open meeting approximately once every two months with speakers and programs of interest.

Present officers of the association are:

President, George Kalvog, Austin Sheet Metal Works.
Vice President—L. B. Searle, Sunbeam Heating & Air Conditioning Co.
Managing Director—R. Hamlin Petty, Sr., 7 S. Dearborn St.

◆

The Alliance staged a meeting on May 17, inviting contractors interested in warm air heating, builders, manufacturers and suppliers, to discuss the present and the future of the home building activities in the Chicago metropolitan area.

Three special speakers were invited to address the group. The first, George Boeddener, managing director of the National Warm Air Heating & Air Conditioning Association, Cleveland, reported that surveys of his association indicate that furnace production will be ample for anything approaching a normal building year, following the war, but if home building construction approaches some of the very large predictions already made, the furnace production industry may find itself unable to meet the demand. But, said Mr. Boeddener, it looks now as if the real problem will be one of sales manpower. We will also have some difficulty with installation labor because we have no apprentices in training.

The warm air heating industry should remember that our industry is not the only one doing research work and after the war we may anticipate a more active competition from the radiator heating industry. We should make every effort to capture an even larger part of the new house construction market. Mr. Boeddener also pointed out that whereas new house construction has been variously estimated at from 400,000 to 1,000,000 per year for a ten-year period, it is quite possible that the modernization and repair market will be even larger, as materials and equipment become available. The National Warm Air Association has estimated that we may find a sales market for approximately 160,000 furnaces in houses which are now stove-heated; there may be as many as 280,000 furnaces installed as modernization and replacement; these approximately 450,000 furnaces coupled with a possible 400,000 furnaces used in new houses will mean a market surpassing all previous yearly production volume.

James R. Scott, Chairman of the Advertising & Merchandising Committee of the National Warm Air Heating & Air Conditioning Association, predicted that we may be reasonably sure of boom conditions following the war, and our industry should begin now to make home owners conscious of the importance of better heating.

To insure acceptance for our product will require a very extensive advertising and publicity program and we should launch this program just as soon as possible. For the present, said Mr. Scott, warm air heating dealers and manufacturers should co-operate with the fuel conservation program now being launched. It behooves every warm air heating dealer to repair just as many furnaces as possible. While we are repairing and maintaining furnaces, we should begin our plan for post-war sales. Our program should be one designed to impress the home owners with the desirability for conditioned air, meaning thereby equipment which warms and cools, cleans, circulates, humidifies, and insures comfort at the floor and throughout every room in the dwelling. This industry should also begin now to train its dealers and engineers in order that after the war we will be able to actually install the advanced type of heating systems.

Milton M. Bowen, Executive Secretary, Metropolitan Chicago Home Builders' Association, believes that despite some predictions for a one million houses a year program after the war, 700,000 new houses a year is more likely to occur. One indication of what we may anticipate after the war is probably found in the fact, said the speaker, that we have had more real progress in home construction in the past five years than we had in the previous fifty—this indicates that we will have better equipment, newer types of houses, and that we will be asked to provide the home with considerably better equipment. Some surveys have indicated that speculative builders are interested in improved types of heating systems since better heating is readily salable to the prospective home owners.

Mr. Bowen suggested that the warm air heating industry begin now to acquaint builders with what we actually have in the way of improved heating systems. Also the warm air heating industry should convince builders that a larger percentage of the total building dollar should be spent for warm air heating and winter air conditioning.

Mr. Bowen also predicted that we will have continued slum-clearance and project developments following the war, aimed to provide low-income groups with better housing facilities. Home builders generally acknowledge that the one-third lowest income group in the country does not earn enough to buy $5,000 and $6,000 houses. The building industry should convince home owners that the $2,000 single-family house, privately financed and constructed according to existing standards and practices is an impossibility. It is high time that the construction industry began to state plain facts to correct these erroneous impressions.

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Fox Valley

In 1940 the Fox Valley Furnace & Sheet Metal Contractors Association tried a new scheme—an open meeting to which salesmen, suppliers, manufacturers' representatives and manufacturers were invited to meet the members of the association in an evening's open house. On April 18, the Fox Valley association held the fifth such meeting and despite difficulties of transportation some 44 members and guests attended.

So that everyone might know the other fellow, President Stowell introduced all the officers and directors of the association and in turn called upon representatives from the various manufacturers and jobbing firms to stand up and say a word to the group.

The speaker of the evening was Harry Ebbert of the Grant Wilson Company, who spoke on a contractors' plan for doing post war thinking. The highlight of Mr. Ebbert's address was his point that contractors should offer the public now the best possible service plan they can manage with their limited manpower and materials resources. Every job so repaired or kept operating should be placed on the contractor's records as a future call after the war for the sale of new heating equipment.

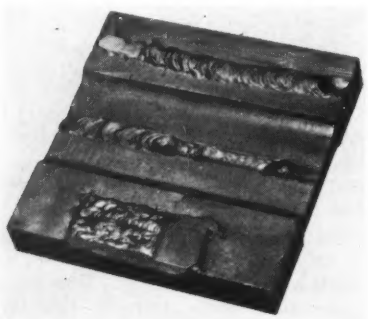
New Products . . . . . .

For your convenience in obtaining information regarding these items, use the coupon on page 96.

38—Arc Welding Aluminum

The Research Department of the Eutectic Welding Alloys Company, 40 North St., New York 13, announces a new electrode with a new coating which can now be used in the welding of aluminum sheet and castings. This rod, known as EutecTrode 2100, opens a new field for arc welding—the salvage and reclamation of aluminum castings. It is possible, with this new electrode, to add metal without completely preheating the casting, and particularly without danger of overheating the adjacent metal.

The new rod has shown itself to be extremely successful in the addition of metal on faulty or improperly machined castings, overlaying of surfaces which have been improperly cast, filling of "low spots," changing of aluminum patterns already machined, filing of faultily-drilled holes, filling and overlaying of porous



castings, and welding of casting to aluminum sheet.

Another field where this new electrode will speed up work is in the joining of aluminum sheet.

The rod is shielded with a special coating which permits its application even without preheating. It insures an even and rapid flow of metal and the slag can be removed by simply wire brushing the weld.

EutecTrode 2100 is a high aluminum and low silicon composition which alloys itself to practically every type of aluminum. EutecTrode 2100 is available in ⅛, 5/32 and 3/16 in. sizes and is recognized by a long blue tip.

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39—Versa-Tool

York Electric and Machine Company, York, Pa., offers the Versa-Tool as a high or low-speed drill—a metal shear, a metal normalizer, a nut runner, a screw driver, and a tapper.

Versa-Tool's power plant combines both rotating and reciprocating action movements. Various shaped Versa-Tool dollies, together with blocks required for shaping all types of metal, are available.

△ 40—Hydraulic Vise

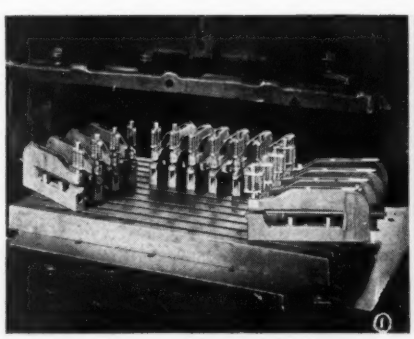
Reimuller Brothers Company, 9400 Belmont Avenue, Franklin Park, Illinois, offers a new hydraulic vise with all steel hydraulic foot control—rugged, "V" ways, semi-steel, with precision construction.

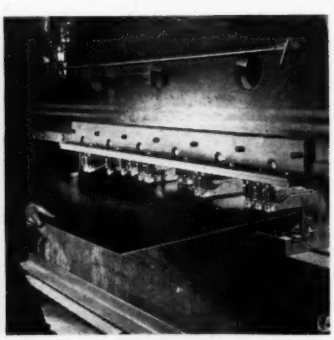
The Reimuller Precision "V" way vise is designed to meet the problems

of mass production. The unit can be mounted vertically and used for a production press on small precision upsetting, heading, and other small operations requiring dies or tooling.

Only two levers are used in the hydraulic foot-control.

The new vise is portable in that it is equipped with flexible hydraulic hose which lends adaptability to use on other machines. Two sizes are available; 4 ton with 4 in. opening, and 7 ton with 7 in. opening.





41—Hole Punching Units

The Wales-Strippit Corporation, North Tonawanda, New York, announces Wales Type "BC" Hole Punching Units.

These "BC" Units are designed to punch an unlimited number of straight line, scattered and staggered hole patterns with varying center-to-center distances. Square sheared and curved sheets and long strips of flat material may be perforated with these units in short as well as long runs.

A group of Wales Type "BC" Units may be used interchangeably in press brakes and stamping presses by mounting on T-slotted plates, templates and rails.

After a pattern has been run, the same group of units may be used in another hole punching pattern.

By using two Wales T-slotted Plates and two groups of Type "BC" Units, it is possible to have one pattern operating in press while another pattern is being set up on the second T-slotted Plate away from the press.

42—Electrode No. 200

The Wilson Welder and Metals Co., Inc., 60 E. 42nd St., New York City, announces a new Coated Aluminum-Bronze Electrode—Wilson No. 200. This new, coated high tensile bronze electrode is a Shielded Arc Electrode, and can also be used as a filler rod in Carbon Arc Welding. It will produce welding deposits of great strength and high ductility, combined with desirable resistance to corrosion.

Deposits made with the Wilson No. 200 Electrode are superior to standard manganese bronze with respect to corrosion resistance, and are equal to it in strength, hardness and ductility.

The Wilson No. 200 has a universal application in the welding of most bronzes, malleable and cast iron or steel. In addition, it has other specific applications, such as welding Manganese Bronze conforming to Federal Specifications QQ-B-726b, or Navy Specifications 49-B-3e for Marine Propellers and other parts where strength, ductility and corrosion resistance are strict requirements.

The Wilson No. 200 can also be used for welding dissimilar metals, such as cast iron to brass, steel to malleable iron, or the joining of any two metals which are weldable with aluminum-bronze.

Sizes from ⅛ to 3/16 in. in 14 in. lengths and ¼ in. in 18 in. lengths are standard stock items.

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△ 43—Solderless Connections

Aircraft-Marine Products, Inc., Harrisburg, Pa., offers terminal connections for electrical wiring in a wide variety to fit the job. A small tool resembling pliers is used to crimp the terminal connections in such a way that a perfect connection results without the need of heat. Press dies are available.

jumbo problem:

heat one of America's largest bomber plane modification centers . . . 35 acres under one roof . . . 108,000,000 Btu per hour . . . 400,000 sq. ft. of non-metallic duct work . . .

The size alone of this vast structure presented an unusually difficult problem of heat distribution. In addition, the building was broken up into ten hangars and three service bays, each bay containing a machine shop and offices. Due to the great height of the bomber planes no part of the heating system could be installed lower than forty feet above the floor in the hangars. The throwing of warm air from a forty foot height required correct air velocity and diffusion to permit heated air to reach the floor level and to minimize the differential between floor and ceiling.

solution: Setting a new standard in the heating of large hangar areas this building required one of the largest direct-fired forced air heating systems ever installed. Six central heating rooms were constructed, each room containing three Dravo heaters totaling 18,000,000 Btu capacity and operating into a common header. From this the extensive overhead duct system distributed warm air to the hangars, service bays and numerous offices. Each heater was coal fired by a stoker that was fed from a bin built underneath the concrete runway. This Dravo method proved most satisfactory and was later used to heat two smaller but similar modification centers in the Southwest.

Write for Bulletin 509

DRAVO Heating

DRAVO CORPORATION, PITTSBURGH

NEW PRODUCTS

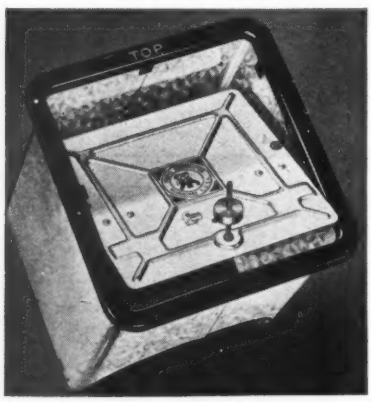
For your convenience a number has been assigned to each item. Circle the items in which you are interested on the coupon on page 9 and mail to us.

△ Indicates manufacturer not listed in 1944 Directory.
● Indicates product not listed in 1944 Directory.

32—Draft

Perfex Corporation, 420 W. Oklahoma Ave., Milwaukee, Wisconsin, offers a new series of barometric draft controls with exclusive new features.

A new type of hinge pivot made of spring steel assures permanent calibration after the initial setting and contributes to the sensitivity of the vane. The square construction of the



vane and the thimble channel allow 20 per cent greater air volume than is obtained with conventional round-type controls. The vane itself is made of aluminum for lightness, which also contributes to precision action and sensitivity.

An off-center turn-weight is used to adjust the action of the vane. Once adjusted, it retains its position without complicated locking or setting.

Four models, for use in pipes of sizes ranging from six inches to twelve inches, are available.

△ 33—Infra-Red Lamp

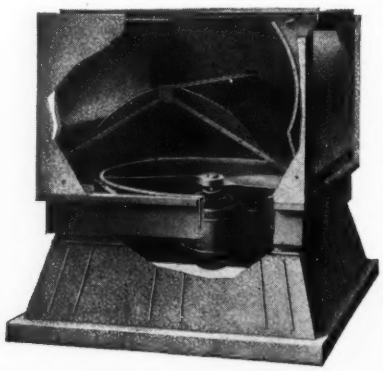
Wabash Appliance Corporation, 335 Carroll St., Brooklyn 31, N. Y., announces a new 375-Watt reflector type infra-red heat lamp.

This higher-wattage Birdseye RE-40 is designed to produce higher drying temperatures not possible with available 250-watt sizes. With the addition of the 375 watt lamp, the Birdseye RE-40 reflector type infra-red heat lamp is now obtainable in 125, 250 and 375 watt sizes for flexible control of temperatures.

Heat-proof Superlok base, more efficient and durable ceramic heat reflector disc, the famed Wabash tungsten "M-Filament," and built-in reflector are standard features of the new 375 watt Birdseye infra-red lamp.

△ 34—Iron Lung

Powermatic Ventilator Company, 4019 Prospect Avenue, Cleveland 3, offers the Iron Lung, a new power ventilator for removing fumes, gases,



steam, smoke, and excessive heat from industrial buildings.

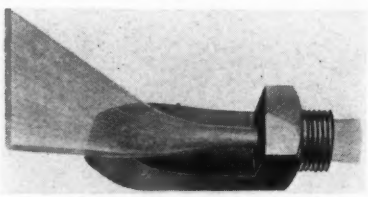
The new Iron Lung is changed from round to square design, is much sturdier, operating parts are easily accessible, and a new damper design insures trouble-free operation.

The Slip-Slot hinge is new—has only three parts. It is self-cleaning, not affected by corrosion, requires no oil or grease, and can not freeze.

35—Flatjet Nozzles

Spraying Systems Company, 4021-F West Lake Street, Chicago 24, has designed for use wherever a sharp, flat hard-hitting spray is needed, the "Flatjet" spray nozzle.

The "Flatjet" spray nozzle is built without cores, vanes or other obstruc-



tions, depending solely on design to produce the desired spray pattern. Standard nozzles are made of brass, steel, or stainless steel one piece construction.

"Flatjet" nozzles range in capacity and spray angle from 1 GPM and a 15 deg. spray angle to 20 GPM and a 35 deg. spray angle.

△ 36—Rust Dissolver

Western Reserve Laboratories, 72 Climax Bldg., Cleveland 13, Ohio, has developed Manganesed-Phospholene No. 7, a rust dissolver, which dissolves rust and combines chemically with metal surfaces to form a rust-inhibiting coating which resists further rusting and corrosion.

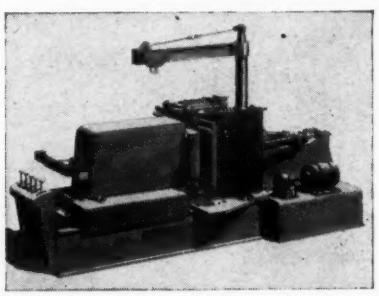
Ready to use, it is brushed or sprayed on metal after oil, grease, or other foreign matter is removed. One application is sufficient for light rust, several applications for heavy rust. The rust dissolves no matter how heavily encrusted.

Machinery, instruments, tools, water pipes, hoists, radiators, metal doors, structural steel, ventilators and other metal surfaces subject to rust can be brushed, sprayed or dipped into the compound.

△ 37—Tangent Bender

Struthers Wells Corporation, Titusville, Pennsylvania, offers the improved Struthers Wells Tangent Bender—to edge bend sheet metal in the lighter gauges.

"Tangent Bends" in many con-



venient forms, can be bent cold in one operation. The metal is smoothly upset so that no further finishing is required.

Many types of new streamlined steel equipment can be produced economically with the Struthers Wells Tangent Bender—refrigerator cases, kitchen cabinets, stoves, boxes, metal furniture, bathroom equipment, airplane and automobile parts.

The Struthers Wells Tangent Bender is designed for improved edge beveling, but can also be used as a horizontal 50-ton press for blanking, piercing, forming, embossing and other continuous profitable operations.

New Literature

For your convenience in obtaining copies of New Literature use the coupon on page 96

240—Control Surface Finish

George Scherr Company, Inc., 128 Lafayette St., New York 13, offers a new 4-page folder on the inspection and control of surface finish, entitled "Spencer Binocular Microscope for Finish Control." Model No. 25 illustrated has a vertical prism body, horseshoe base, inclination joint, triple revolving nosepiece, and understage mirror.

241—Plastic Housed Thor Specifications

Independent Pneumatic Tool Company, 600 West Jackson Blvd., Chicago 6, is distributing a deluxe brochure covering the history, development, features and specifications of the recently introduced Thor Plastic-Housed portable electric drill. The brochure is entitled "Tools to Build the World of Tomorrow . . . born from the need of today."

242—ACP Metal Stripping Solution No. 2

American Chemical Paint Company, Ambler, Pa., offers Technical Service Data Sheet No. 13-14-2-2, on the subject of the removal of coatings of copper, lead, zinc, cadmium and magnesium from basic metals such as steel, nickel, chromium and aluminum by means of ACP metal stripping solution No. 2.

The data sheet tells what the solution is, what it does, conditions under which used, equipment required, steps in the process, the stripping bath preparation, control of the bath, stripping, rinsing, drying, packaging.

243—Oxy-Acetylene Handbook

The Linde Air Products Company, a unit of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York, N. Y., has published "The Oxy-Acetylene Handbook." This new 600-page manual is invaluable as a guide for self-instruction and also as a standard classroom textbook in vocational and trade schools, technical high-schools, and engineering colleges. It covers the entire range of the oxy-acetylene process, giving clear, easy-to-follow instructions for handling all the common commercial metals, together with simple explanations of the fundamental principles of the various methods of depositing and controlling molten metal. Considerable space is devoted to an explanation of the operating principles of oxy-acetylene equipment and instructions for its care and maintenance.

In addition to its use as a textbook for teaching students how to weld and cut, or teaching experienced operators how to improve their welding and cutting. The Oxy-Acetylene Handbook will also serve as a guide and authoritative reference book for plant management people, engineers, designers, superintendents and foremen in shops where oxy-acetylene welding and cutting is used or might be used as either a production or a maintenance tool.

This is a how-to-do-it book. A few of the many subjects covered are: How to set up, operate, and care for oxy-acetylene apparatus; what flame adjustment to use and how to use it; how to identify metals; how to weld steel, cast iron, malleable iron, galvanized iron; how to weld aluminum, copper, brass, bronze, nickel, Monel, lead, magnesium; how to bronze-weld; how to do heating, bronze-surfacing, hard-facing, flame hardening, silver-brazing; how to cut steel, cast iron, stainless steel; how to test welds; how to develop welding procedure controls; how to organize and lay out a welding shop.

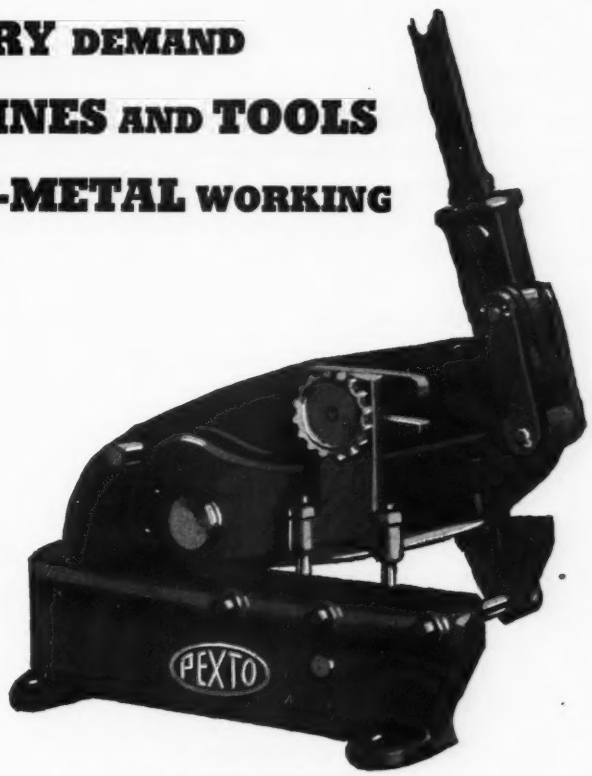
The Oxy-Acetylene Handbook, price $1.50, may be purchased at technical book stores, or at any sales office of The Linde Air Products Company.

PEXTO

MEETS EVERY DEMAND FOR MACHINES AND TOOLS FOR SHEET-METAL WORKING

The PEXTO all-inclusive line of sheet-metal working Tools and Machines covers all requirements for heavy and light, normal and intricate fabrication.

Ability to withstand the stresses of year-after-year hard service is justification for your initial investment ... guarantee of lowest hourly costs.



SLITTING SHEARS

THE PECK, STOW & WILCOX COMPANY Since 1795 SOUTHINGTON, CONNECTICUT, U. S. A.

Why not tie up with the pioneers of bituminous ash removal stokers ?

● The "Original" POCAHONTAS Bin-Feed, Ash Removal Stoker was born, not by some manufacturer who wanted to make something to sell, but by the World's Largest Producer of Smokeless Coal, who many years ago recognized that sooner or later coal must become a completely automatic fuel to survive the inroads made by other means of automatic heating.

Pioneering is never an easy job. It has taken a great deal of money, years of research, thousands of installations, to prove that the modern POCAHONTAS Ash Removal Stoker can and does give the finest automatic heat on the market! They said it couldn't be done—but we've been doing it since 1935!

We recognize that when domestic stokers can be manufactured again, we will not be alone in the ash removal stoker field. Sound reasoning, however, on the part of any stoker dealer will point out the logic of making a connection with a manufacturer who not only knows coal, but has been farsighted enough to pioneer the only successful bituminous ash removal stoker.

May we suggest you write us today for full information on our Commercial and Ash Removal Stokers.

POCAHONTAS FUEL COMPANY INCORPORATED
338 East 131st Street • Cleveland 8, Ohio

"ORIGINAL"
POCAHONTAS
THE STOKER OF TOMORROW —TODAY!

New Literature

For your convenience in obtaining copies of New Literature use the coupon on page 96.

244—Pier Catalog 42

Pier Equipment Mfg. Co., Milton & Cross Sts., Benton Harbor, Michigan, has released Catalog 42, illustrating and describing manual and automatic spot welders. Details of important parts, regulator controls and automatic weld timer for controlling the timing periods are given. The foot-operated welders listed range from 5 to 50 KVA capacity; the air-operated press types included 20 to 30 KVA capacities, with high speed projection and spot welders of 30, 50, 75, 100 and 150 KVA capacities. Welding capacity charts for all Welders sizes and for different throat depths are included.

245—Galvalloy

Metalloy Products Company, 1351 East 17th Street, Los Angeles, California, announces new uses for Galvalloy —the covering of welded seams on galvanized material where the welding process has burned off the galvanizing being one.

Galvalloy is used by aircraft and foundries for filling in blowholes or defects in aluminum castings, soldering aluminum alloys, filling in spongy spots on castings, model planes, etc. Damaged die plates can be repaired quickly with Galvalloy. Seams on aluminum alloy can be sealed.

Sandblasting or cleaning by acids, or flux, is not required.

246—Oil-Burning Furnace Standards

The National Bureau of Standards, U. S. Department of Commerce, Washington 25, D. C., offers Commercial Standard CS113-44, covering "Oil-Burning Floor Furnaces, equipped with Vaporizing Pot-type Burners," accepted by the trade as its standard of practice for new production beginning February 17, 1944. This recorded voluntary standard of the trade is for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.—Price 10 cents.

247—Resistance Welding—GET 1189

General Electric Company, Schenectady, N. Y., is distributing publication No. GET-1189 entitled "Resistance Welding—a Modern Method of Metal Fabrication," by R. T. Gillette. This 28-page book is divided into four parts—Resistance-Welding Methods and Equipment, The Selection of Equipment for Best Welding Results, Welding Electrodes and Their Maintenance, and Material and Its Preparation for Welding.

248—"Janitrol" Heater Engineering Specifications

Surface Combustion, Toledo, announces engineering specifications for the "Janitrol" aircraft heaters, which are built on the revolutionary whirling flame principle.

The six-page form (3-44) shows 25 halftone and line drawing illustrations and gives the combustion air regulations and ignition details for the standard vaporizing or spray type models in the 15,000, 50,000, 100,000 and 125,000 Btu. capacity heaters. Other features include dimensional drawings of heaters and accessories, performance characteristics tables, standard control arrangements with basic schematic electrical circuit diagrams, standard fuel combinations and pictures of standard models.

One page provides a data sheet for questions on proposed installations of the new aircraft heater. A sketch sheet on which to show heater orientation in airplane is also included in the folder.

BROTHER, HERE'S MY WAR STRATEGY

The bigger the job *we heating men* do during the next four warmer months, the more fuel—coal, oil, gas—will go into active war service next winter, and the less dangerous will be the heating situation on the home front.

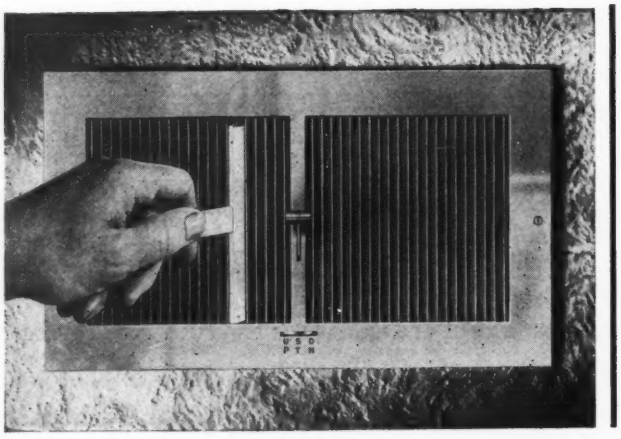
Let's look at it this way . . . WE'RE THE FUEL SAVING EXPERTS IN OUR OWN COMMUNITIES!

Here's *my* local fuel conservation program: First of all I'm installing every automatic control I can get. I'm checking over all old controls to see that they're in working order. I'm double-checking every part of the heating plant for deterioration, cleaning out accumulations and rust. And I'm recommending thorough protection against heat loss. I'm doing it systematically, right down my customer list—both homes and commercial buildings.

Think of this: WE HEATING MEN CAN DO MORE THAN ANY OTHER TRADE GROUP TO CUT THE NATION'S FUEL LOSS TO THE ABSOLUTE MINIMUM. It's our responsibility—more than any other group of Americans. The place—right in our own communities. The time—*now, during the next four months!*

Let's make these weeks ahead really count in terms of fuel saved next winter.

This advertisement sponsored by Perfex Corporation, Milwaukee, in support of the national government fuel-saving program. Reprints available upon request.

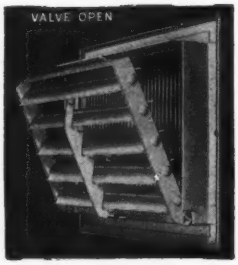


H&C No.75 DESIGN

FOR THE MAXIMUM OF A.C. PERFORMANCE!

Employs the Incomparable H & C TURNING BLADE VALVE

Get Set for the Post War Rush



No other register will give you such thorough and complete distribution of the air flow; for no other register has the TURNING BLADE VALVE. This valve when open extends back the full depth of the duct, smoothly dividing the air flow with equal velocity to every portion of the register face. The result is less turbulence, less resistance and better distribution to the farthest parts of the room. Yet in spite of this vast superiority No. 75 is not expensive. It costs no more than conventional double deflection registers.

H & C ITEMS NOW AVAILABLE: A. C. Designs Nos. 69, 74, 75 and 88. Gravity, Nos. 210, 265, 130, 330, 345, 623, 653, 250, 2250. Also complete accessory line. See Catalog No. 42 for details.

H&C

HART & COOLEY MANUFACTURING CO.

World's Largest Manufacturers of Registers, Grilles, Furnace Accessories

HOLLAND • MICHIGAN

New Literature

For your convenience in obtaining copies of new literature use the coupon on this page.

249—How Zinc Saves Steel

The New Jersey Zinc Company, Market Development Division, 160 Front St., New York 7, offers a 24-page and cover booklet entitled "How Zinc Saves Steel from Rusting" intended to be helpful in evaluating the paint coatings which will be offered in the post-war period.

Zinc pigments have figured prominently in the various paint formulations and the purpose of this booklet is to summarize these developments and to emphasize the most efficient utilization of zinc pigments in the protection of iron and steel. Two pages are devoted to specifications used for pigments in paints for Federal, U. S. Army, U. S. Navy and U. S. Maritime Commission.

◆

250—Welding Supplies Price List

The Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y., announces the publication of a twenty page, revised price list, "Gas and Electric Welding Supplies and Accessories."

The products in the revised list include Gas Welding Rods made in a wide range of metals, types and sizes for all welding requirements. Other products listed and described are Hard-Facing Alloys, Brazing Alloys, Fluxes, Helmets, Goggles, Gloves, Aprons, Welding Cable, Cable Lugs and Ground Clamps.

In addition to prices, the contents include detailed information of assistance to buyers, such as: sizes, dimensions, weights, stock numbers, forwarding data and recommended uses for products.

Among the new items described are the Airco No. 66 Welding Helmet, the Suregrip Rod Saver, and the Atlas Model A Dual-Tool for cleaning welds.

◆

251—Welding Pre-Heating Temperatures

The Lincoln Electric Company, 12818 Coit Rd., Cleveland 1, has designed a new calculator for determining the welding, preheating and interpass temperatures of steel in those few cases where experience indicates the need for preheating to obtain best welding results.

This useful calculator is 6¼ inches in diameter and consists of four movable sections of heavy cardboard stock.

Although most steels are readily weldable and require no preheating because of low carbon and alloy content, this calculator will serve as a convenient guide in instances where steels have a higher content of carbon and other alloys and require preheating to minimize the tendency toward excessive hardening and possible cracking of the base metal adjacent to the weld.

The calculator is priced at 25 cents, postpaid, anywhere in the United States.

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave.
Chicago, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Circle numbers in which you are interested):

32	33	34	35	36	37	38	39	40	41	42	42
240	241	242	243	244	245	246	247	248	249	250	251

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Company .....

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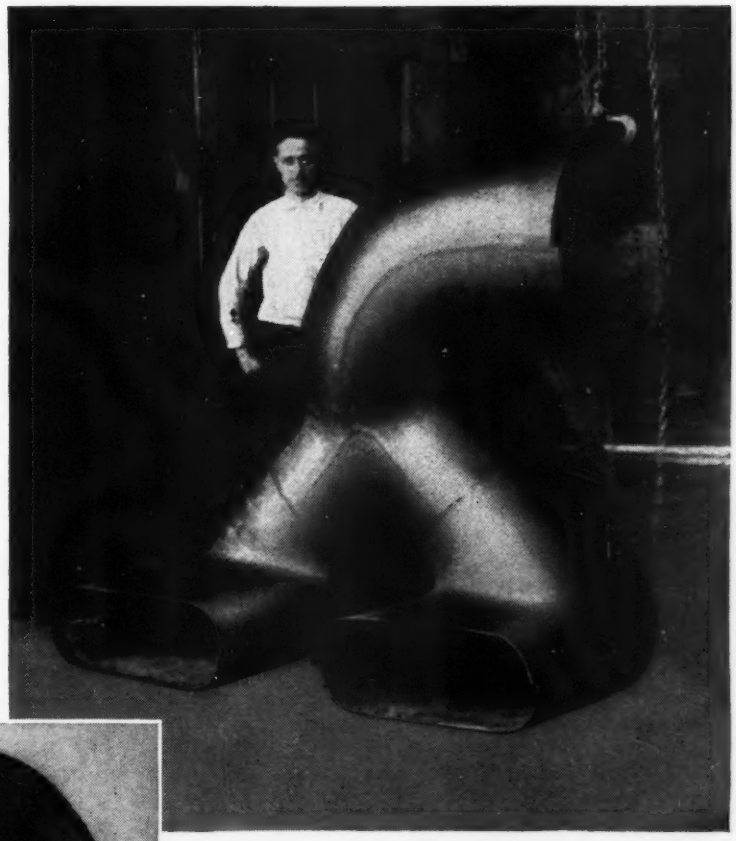
Are you Manufacturer——Jobber——Dealer——

PRACTICAL PROOF OF COPPER'S *Ductility*



Head Box Distributor Pipe fabricated by
R. A. Burroughs & Company, Inc., Norfolk, Va.

THIS LARGE DISTRIBUTOR head provides a convincing demonstration of the ductility and easy working properties of copper. Fabricated from #10 Stubs' Gage (.134") Anaconda Sheet Copper, and oxy-acetylene welded with Anaconda Silver Bearing Copper Rod, this complicated right-hand fitting and a left-handed duplicate are in use in a Southern paper plant to distribute paper stock to an unusually wide screen.

By taking advantage of copper's malleability, this angle-free design was achieved. Unrestricted flow of the pulp is assured . . . there are no corners, pockets or other flow traps.

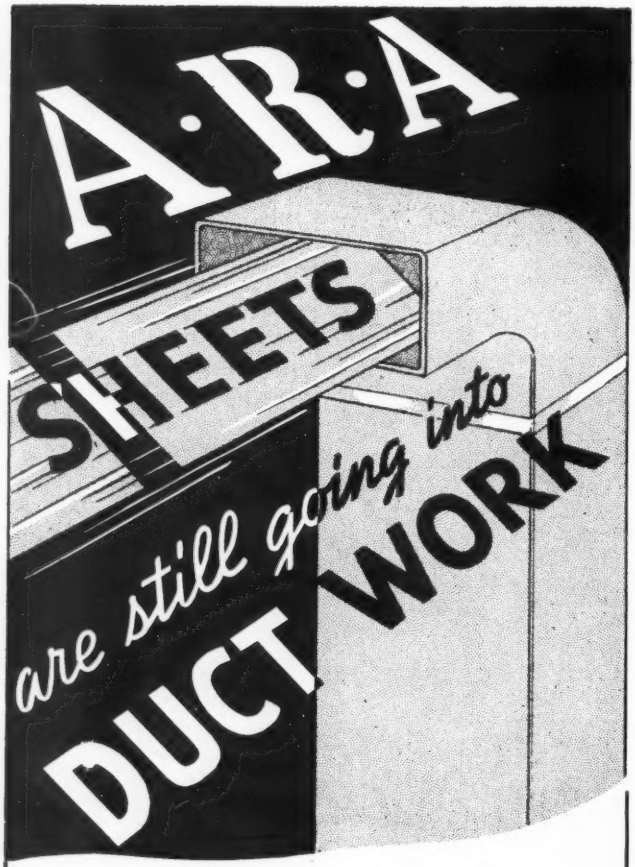
Rustless, corrosion-resistant copper can be counted on to give long, trouble-free service. Maintenance difficulties, with materials less durable, have convinced industry of the economy of copper and its alloys. When conditions permit, Anaconda Copper, Brass and Bronze will be ready for those who now use substitutes.

ANACONDA

Anaconda Copper & Copper Alloys

THE AMERICAN BRASS COMPANY—General Offices: Waterbury 88, Connecticut

Subsidiary of Anaconda Copper Mining Company • In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*



Plan your Duct-work and go ahead with it! You can be sure of getting A-R-A Sheets when you want them and in any quantity. DON'T PASS UP BUSINESS! KEEP YOUR JOBS ON SCHEDULE!

Asbestos clad A-R-A Sheets are tough yet flexible—rigid but not brittle—fire-proofed and moisture-proofed—will not dry out, crack, crumble or chip. A-R-A Sheets have a high insulating value (K. .45 B.T.U.)—good sound deadening properties—and they deaden metallic rattle.

Here is the package of A-R-A Sheets that make it the most convenient to ship, stock or carry on the job. The Sheets are always clean and in good condition.

CARTON CONTENTS

20 Sheets 33" x 48" Per Carton

40 Sheets 16½" x 48" Per Carton

Shipping Weight

Approximately 100 lbs. per Carton

Sheet Thickness

Approximately 3/16" thick

You can now get Genuine A-R-A Sheets from Your Jobber

Write today for the free 16-page Illustrated booklet No. 89-A

GRANT WILSON, INC.

4101 WEST TAYLOR ST., CHICAGO 24, ILLINOIS

With the Manufacturers

New Osborn Officers

At a special meeting of the Board of Directors of The J. M. & L. A. Osborn Company held in Cleveland on Wednesday, April 5th, G. F. Climo was elected president of the company, to succeed the late A. W. Howe.

The Osborn officers now are G. F. Climo, president and treasurer; C. E. Caddy, vice president, and J. W. Harrison, secretary.

Mr. Caddy who had been in charge of the company's Buffalo Division is now located at the General Offices in Cleveland and A. E. Kirchgraber has been appointed manager of the Osborn Buffalo Division.

C. F. Gruenert, until recently assistant to Mr. Climo in the Purchasing Department, is now taking over the management of that Department.

◆

Changes Name to Cover Expansion

J. A. Walsh & Co., Inc., is the new name of the well-known Air Conditioning Company, distributors and engineers, 3215 McKinney Avenue, Houston.

James A. Walsh, who continues as the firm's president, stated that the change in name involved no changes in management or personnel, but that capitalization has been increased to allow for post-war expansion plans.

Present lines distributed include General Electric heating, air conditioning, commercial refrigeration and water cooling equipment, Frick ammonia refrigeration, Chelsea exhaust and blower fans, Hunter attic fans, Day & Night wall and space heaters and floor furnaces, Hunt Concrete Cure, J-M rock wool insulation, and other allied lines.

"While our company is giving first attention to war contracts and defense housing jobs, we are laying plans to gear our services to the new products and the new needs of the post-war period," Mr. Walsh stated.

◆

Williamson Directors

The stockholders of The Williamson Heater Company on April 3 elected the following men to the Board of Directors: F. Wm. Enzweiler, Frank E. Kise, Larry A. Knollman, Gustav Leytze, W. L. McGrath, Paul E. Mertz, Lawrence B. Murphy, Joseph A. Stermer, and George T. Trundle, Jr.

All are employees of The Williamson Heater Company. The company is 98 per cent employee owned and has been on a profit sharing basis for 12 years..

Enzweiler, with 36 years' service, is vice president in charge of the foundry. Kise is secretary and is jobber sales manager and has 36 years' service. Knollman has been with the company 26 years and is dealer sales manager. Leytze, production control manager, has been with the company 20 years. W. L. McGrath, a national figure in the furnace industry, is president of the company. Paul Mertz, treasurer, has been an employee 41 years. L. B. Murphy is executive vice president, and has 20 years' service. He is the son of the late W. H. Murphy, former treasurer. Stermer is vice president and retail sales manager, with 36 years' service. George T. Trundle, Jr., of Cleveland, Ohio, has been adviser to Williamson on production, budgets, and other matters for the past 8 years.

◆

General Controls Atlanta Branch Office

General Controls Co., Glendale 1, California, manufacturers of pressure, temperature and flow controls, announces the opening of a new branch office at 376 Nelson St., S.W., Atlanta 3, Georgia. Complete factory sales and service to customers in Atlanta are under the direction of Branch Manager Roger W. Allen.

Scientific DESIGN

. . . will give RUDY dealers sales advantages tomorrow!

When you select the line of heating equipment with which to meet the great sales opportunities of tomorrow, consider well the design features that have made Rudy one of the greatest symbols of quality for 30 years. Continuous profits come only when your customers are thoroughly satisfied — Rudy research, scientific design and specialization in quality home heating have always given Rudy dealers that "extra something" to tip the sales balance in their favor.

Rudy engineers have made a thorough study of the trends for post war home design and construction — and as in the past, Rudy will have the scientific answer to all your heating problems.

Rudy

FURNACES

Write today for this free, twice monthly bulletin. Contains useful information, ideas, plans you can use every day.

RUDY FURNACE COMPANY • DOWAGIAC, MICH.

EVEN FINER RUDY PRODUCTS FOR THE WORLD OF TOMORROW

With the Manufacturers

Honeywell Forms Modulation Division

Minneapolis-Honeywell Regulator Company, 2726 Fourth Ave., South, Minneapolis 8, announces the formation of a new division to manufacture and market its recently announced Moduflow heating control system.

Harry C. Jenkins, formerly midwestern zone manager, has been promoted to managership according to C. B. Sweatt, vice-president, while a nucleus of a sales organi-

H. J. Jenkins, Bird, Peterson, McLouth.

zation has been started by the addition of three specialists to the staff. Applicable to all types of heating systems in present, as well as postwar homes, Moduflow will not be placed in the market until after victory or until materials are made available.

Assisting Jenkins in his new position are three engineers who will work for the present in the Minneapolis and Chicago offices of the company. They are John E. Peterson, Milford G. Bird and Bruce F. McLouth.

Peterson, president of the Illinois Sheet Metal Contractors Association from 1941 to 1943, and assistant mechanical engineer for the Corps of Engineers, U. S. Army, was formerly president of the Home Heating Company, Hinsdale, Ill. He has been assigned to Minneapolis-Honeywell's Chicago office and has started work after completing a brief technical course at the plant.

Presently on inactive status as a Lieutenant in the United States Army, Bird has joined Honeywell after serving as Battalion Intelligence Office, Infantry, in the South Pacific. He graduated from Chicago Technical Institute in 1934 and was associated with the heating business continuously until he entered the armed services.

McLouth, also an Engineer, attended the University of Michigan and Antioch College, Yellow Springs, Ohio, has been Chief of the Heating Section, 9th Service Command, U. S. Army. He has been well known in the heating industry for the past 17 years. Both Bird and McLouth will make their headquarters in Minneapolis as assistants to Jenkins.

◆

The Armstrong Company, 241 S. Post St., Detroit, manufacturers of "THARCO" asbestos furnace cement, announces the appointment of **George C. McCarten** as general manager. Mr. McCarten will be located at the Detroit offices. Prior to this new connection, he was with American Cyanamid Company for a number of years as a chemical engineer.

Clifford Anderson has assumed the position of general sales manager of the company. Mr. Anderson has been with The Armstrong Company for eight years in the Chicago branch, the last two years as branch manager, and will carry on his new duties from the Chicago office.

Ralph W. King has been made Chicago manager. Mr. King has also been associated with The Armstrong Company for several years.

◆

The Mercoid Corporation, 4201 Belmont Ave., Chicago 41, announces that on and after March 31st, their New York office will be located at 205 East 42nd Street, New York 17, N. Y. Telephone Murray Hill 4-5071. R. Fenton Fisher, vice president, is in charge.

Niagara 18 Gage Foot Operated Shears with 96 inch and 120 inch cutting lengths are ideal for sheet metal shops and maintenance departments requiring long sheets. Easy foot operation is the result of the design of every working part. Treadle extends the full length of the shear and is accessible at any location when cutting large sheets. Holddown is operated by self-locking eccentrics, thus enabling operator to let go of holddown handles while pressing the treadle. Ball-bearing, self-measuring, parallel back gage is standard equipment. Write for Bulletin 80-D. Niagara Machine & Tool Works, 637-697 Northland Ave., Buffalo, N. Y. District offices: Cleveland, Detroit, New York.

You can get it now
You can sell it now

Waterbury

GASTITE FURNACE

MODERATE IN PRICE—HIGH IN QUALITY

Here is a moderate priced furnace for which there is a waiting demand—a furnace worthy to carry the WATERBURY trade-mark.

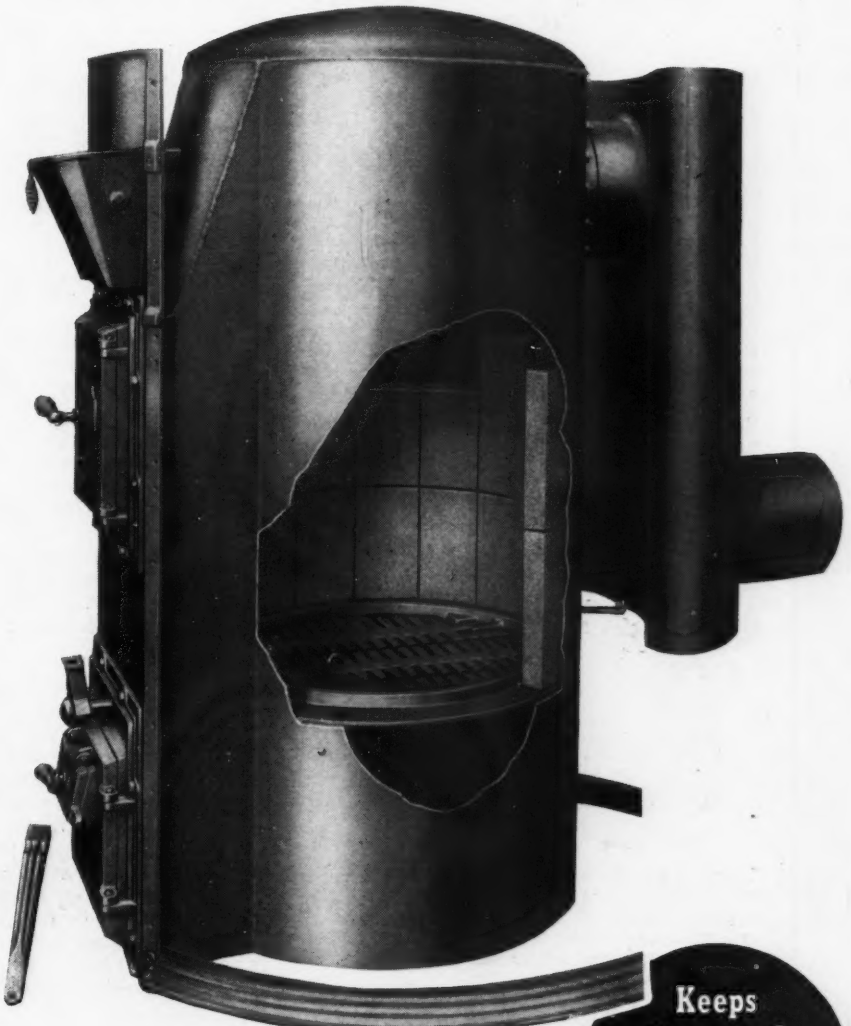
The body is solid one-piece steel construction with large combustion chamber.

Heating efficiency—Fuel economy and Freedom from smoke, gas and ash dust proved by years of performance.

A furnace chuckful of selling points—and every one means sound value and real service to your customer.

Sizes 20" to 27" inclusive. Larger sizes in Seamless series to 36".

Simple design, without sacrificing any essential quality or feature, makes it possible to offer this job at a price to meet your most active present market.



Note.—Water-pan omitted under W.P.B. restrictions.

Keeps Gases and Dust Out of the Heat Stream

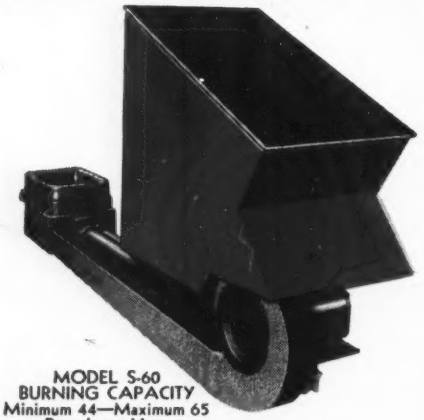
If you want details, write or wire today. We can make deliveries.

THE WATERMAN-WATERBURY COMPANY

1122 Jackson St. N. E., Minneapolis, Minn.

STOKERATOR

WORLD'S GREATEST STOKER VALUE



MODEL S-60
BURNING CAPACITY
Minimum 44—Maximum 65
Pounds per Hour
HOPPER CAPACITY—700 lbs.
RETORT DIMENSIONS 14"x14"

Automatic Coal Burning that's EASY TO SELL

This rugged, heavy duty Model S-60 leads STOKERATOR'S complete industrial-commercial line. It has all the qualities that have made STOKERATOR famous as "the stoker that's easy to sell"—finest engineering, dependable performance, sturdy construction, and lowest cost with longest distributor-dealer margin.

Send your order now! Get those "25 tons or more per year" jobs.

TOMORROW

Tomorrow's STOKERATORS, with refinements and improvements that mean even greater sales appeal, are ready for production as soon as restrictions are lifted. STOKERATOR'S ability to satisfy is proved in thousands of installations. And remember:

STOKERATOR is the line designed and built to give the consumer *more* for less money, but also to give the distributor and dealer better profit.

Inquiries will be answered promptly.

STOKERATOR

NORTHERN STEEL & STOKER CORP.

3100 PROSPECT ROAD PEORIA 4, ILLINOIS

With the Manufacturers

Little Burner Moves

H. C. Little Burner Co., Midwest Division, announces the removal of their offices from Aurora, Illinois, to 32 So. Jefferson St., Chicago, for the greater convenience of oil burning home heating equipment dealers in the Chicago area. Ken Swift will continue to serve as District Representative.

In addition to the H. C. Little automatic vaporizing type oil burner, with electric ignition, the Midwest Division will feature the Company's water heaters, winter conditioners, floor furnaces, oil stoves, wall furnaces gravity furnaces, ceiling furnaces and hot water boilers, Mr. Swift said. He added that these various units have a heat output range of from 30,000 Btu to 300,000 Btu.

◆

Malvin Is Fitzgibbons Vice President

Fitzgibbons Boiler Company, Inc., 101 Park Avenue, New York 17, announces that Ray C. Malvin has recently been appointed vice president and general plant manager.

◆

Copper and Brass Elects Officers

Robert L. Coe, Vice President of Chase Brass & Copper Co., Incorporated, Waterbury, Conn., was re-elected President of the Copper & Brass Research Association at its 24th Annual Meeting held May 25, 1944, at the Hotel Biltmore.

Other officers elected were: Vice Presidents: Wylie Brown, President of Phelps Dodge Copper Products Corporation, New York; William M. Goss, Vice President of Scoville Manufacturing Company, Waterbury, Conn.; Curtis L. Smith, Treasurer of The National Copper & Smelting Company; Herman W. Steinkraus, President of Bridgeport Brass Company; Treasurer, C. Donald Dallas, President of Revere Copper and Brass Incorporated, New York; Manager, T. E. Veltfort; and Secretary, B. B. Caddle.

◆

Payne Service Club

One hundred forty-one men and women with an aggregate of over 950 years of service with **Payne Furnace & Supply Company**, Beverly Hills, California, were honored recently in a ceremony following a banquet, when the Board of Directors presented service pins in recognition of long association with the firm.

D. W. Payne, president of the Company, who for some months has been confined to his home by illness, celebrated his recovery as honored guest of the directors. The Hon. Arthur L. Erb, mayor of Beverly Hills, presented him with a pin denoting over 25 years' service. ("Payneheat," in July 1944, will pass its 30-year milestone.)

E. L. Payne, vice-president and general manager, son of the founder, was second in point of years' service, and pointed out that, of the 141 members of the Service Club, 95 had been with the Company five years or more, and forty, 10 years or more.

◆

Personnel

The appointment of **F. G. Coggin** as Manager of the Oil Burner Controls Division of the **Detroit Lubricator Co.**, 5900 Trumbull Avenue, Detroit, has been announced by **E. J. Doucet**, General Sales Manager. **P. S. Russell**, who formerly held this position, is devoting his efforts to research and development.

Make extra profits in too!

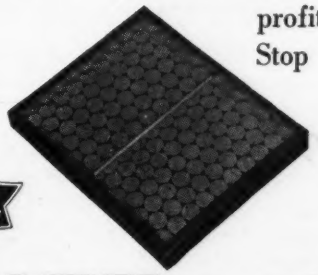
The 1944 Dust-Stop* Spring promotion has been helping a lot of dealers dig up some mighty nice profits. And you can share this good fortune.

This is because a lot of forced-warm-air furnace owners have not yet changed their Dust-Stop Air Filters. And right now, when furnaces are shut down

is the very best time to change clogged air filters . . . put furnaces in tip-top shape. This business can be yours. We help you get it.

Free 1944 Spring Promotion Points Way to Extra Profits

The new Dust-Stop Spring promotion contains free counter and window display pieces, "your-name-and-address-imprinted" folders, radio spot announcement scripts, newspaper ad mats . . . everything to help remind customers to get their Dust-Stops from you. You also receive a free catalog of filter sizes to enable you to fill orders quickly and easily over the phone or counter.



Dust-Stop Air Filters are a nationally advertised product. All through the heating season, millions of householders have read about them in *The Saturday Evening Post, Life, Better Homes and Gardens, House Beautiful, and The American Home.* Remember, there's still time. Pick up some extra profits this June. Ask your nearest Dust-Stop supplier for the Spring Promotion now! *Owens-Corning Fiberglas Corporation, 1930 Nicholas Bldg., Toledo 1, Ohio. Fiberglas Canada, Ltd., Oshawa, Ontario.*

FIBERGLAS* DUSTOP* AIR FILTERS

*T. M. Reg. U. S. Pat. Off.

READ THIS AD AS MILLIONS OF HOUSEHOLDERS —INCLUDING YOUR CUSTOMERS— ARE DOING IN NATIONAL MAGAZINES

IF I LIVE IN THE ANTHRACITE (hard coal) BURNING TERRITORY

Copy of this book sent upon request

This illustrated booklet gives conclusive proof of the great benefits and economies of the automatic home-heating now in store for you. For your free copy, mail the coupon below to the manufacturers of... MOTOR STOKOR

HERSHEY MACHINE & FOUNDRY CO.
540 Penn Street, Manheim, Pa.
Please send me your free booklet: "What can I expect from Automatic Heat in the future?"
Name

The response to our offer of this booklet attests growing public interest in automatic heat... specifically in stoker-fired anthracite. MOTORSTOKOR is prepared to meet the expanding demands of this market, and pre-peace advertising is already lining-up receptive prospects.

The larger sizes of MOTORSTOKOR—those using 25 tons of coal or more per year—are now available. As war-time restrictions are relaxed, MOTORSTOKOR will resume production of its complete line.

Address Dept. A for booklet

MOTORSTOKOR DIVISION
HERSHEY MACHINE & FOUNDRY CO.
Manheim, Pa.

With the Manufacturers

General Controls Co., Glendale, California, recently occupied new branch office quarters at 687 Boylston St., Boston 6, Mass., and at 1505 Broadway, Cleveland, Ohio.

General Controls' Boston Branch is under the direction of Branch Manager William Marsh. A native New Englander, born in Manchester, N. H., Marsh has had 20 years' experience in the automatic controls industry. He has been instrumental in the development of numerous controls for both the gas field and sectional control applications.

L. E. (Rusty) Wetzel, Cleveland Branch Manager, is a native of that city, a graduate of Purdue and John Huntington Institute Technical College where he majored in air conditioning, heating and ventilating engineering. His field experience covers 16 years in the refrigeration and general installation fields.

General Controls Co., are manufacturers and distributors of pressure, temperature and flow controls.

◆

Minneapolis-Honeywell Regulator Co., Minneapolis, Minnesota, announced the appointment of two new branch managers. **Kentner L. Wilson**, previously Industrial Manager of the Cleveland office, has been promoted to branch manager of the Detroit district, C. B. Sweat, vice-president, stated. **Charles Locke**, formerly Branch Manager at Albany, and for the past two years attached to the Production Department at the main plant, has become Branch Manager of the Indianapolis office.

D. J. Peterson, who has been acting as Branch Manager at Detroit, has been promoted to Zone Original Equipment Supervisor and now is in charge of all original equipment activities in the Cleveland Zone. Temporarily, however, Mr. Peterson will make his headquarters in Detroit.

In Indianapolis, **Edward Clucas**, who has been acting Branch Manager, will hereafter be in charge of the Company's Modutrol Division activities in that district, the Minneapolis-Honeywell official continued. All changes will take effect immediately.

◆

G. A. Bassett, President of **Gar Wood Industries, Inc.**, Detroit, announces the appointment of **Donald J. Luty** to the position of General Manager of the Heating Division.

Mr. Luty has been with Gar Wood for fourteen years' and was Assistant General Manager of the Heating Division for many years. He also held the title of Chief Research Engineer of the Company.

◆

F. C. Evans has been appointed representative of **Research Products Corporation** of Madison, Wisconsin, in the St. Louis area. He will cover the eastern half of Missouri and the southern half of Illinois. For the past 16 years, Evans has represented Sunbeam Division of American Radiator and Standard Sanitary Corporation and Chrysler Airtemp Sales Corporation, respectively, in Omaha and St. Louis. His home address is 1225 Kirkham Road, Glendale 22, Missouri.

◆

D. J. Stewart, previously assistant general manager of **Barber-Colman Company**, Rockford, Illinois, has been made vice president and general manager, succeeding Earle D. Parker.

H. F. Collins, former assistant general superintendent of Barber-Colman Company, has been appointed work manager.

◆

Montgomery Ward & Co., Chicago, announces the appointment of **L. M. Remen** as manager of the company's Plumbing and Heating Division. Mr. Remen, has been engaged in the manufacture and sale of plumbing and heating equipment in Chicago for the last twenty years.

News Items . . . . . .

Large-Scale Foreign Maps Wanted

The Army Map Service, War Department, Corps of Engineers, U. S. Army is asking for large scale foreign maps—foreign maps of all areas outside continental America and foreign city plans on a scale of not less than 1:25,000 (2½ inches to a mile) and guide books are needed, as well as gazeteers, postal guides, place lexicons and important atlases. Also road maps and topographical and geological maps on a scale not smaller than 1:1,000,000 (16 miles to the inch).

Any material not available as a gift should be specified as such; reproduction will be made and the originals returned to the owner. You may have data of military value that will advance an important phase of the War undertaking.

Address War Department, Chicago Library Branch, Army Map Service, 79 W. Monroe St., Chicago 3, Illinois. Phone Central 3240.

◆

The National Metal Fabricators has been organized by Frank L. Hofer, H. F. Brunke, William Gauweiler, and Leonard Mortensen, at 2138 S. Sawyer Avenue, Chicago, with complete facilities for fabricating sheet metal, plate, and light structural shapes such as galvanized blow pipe, blow pipe fittings, boiler breechings, smoke stacks, shearing, circle cutting, flame cutting, notching, blanking, punching, stamping, press brake forming up to 12 feet. Arc, spot, and acetylene welding, grinding, polishing, drilling, tapping, spray painting and assembling.

There is a five ton overhead crane inside building and a railroad siding.

◆

The Wm. F. McCormick Sheet Metal Works, heating, sheet metal and roofing contractors of York, Nebraska, celebrated the conclusion of 20 years in business by moving into new and larger quarters at 408 Grant Avenue early this year.

Additional equipment has been installed. The main floor is devoted to a show room, office, workshop and storage. The second floor is being used for storage of pipes, fittings and for heating and drainage material. Roofing materials and equipment are stored in an addition erected on an adjoining lot. Larger windows for better light in the shop are planned.

◆

The Ohio Stove Pipe & Mfg. Co., will now be known as the **Metaloid Company** and will be located at 5815 Kinsman Road, Cleveland.

◆

Edward Rush has become a territorial represenative of the **Standard Furnace & Supply Co.,** of Omaha, Nebraska, covering Eastern Nebraska and Western Iowa.

◆

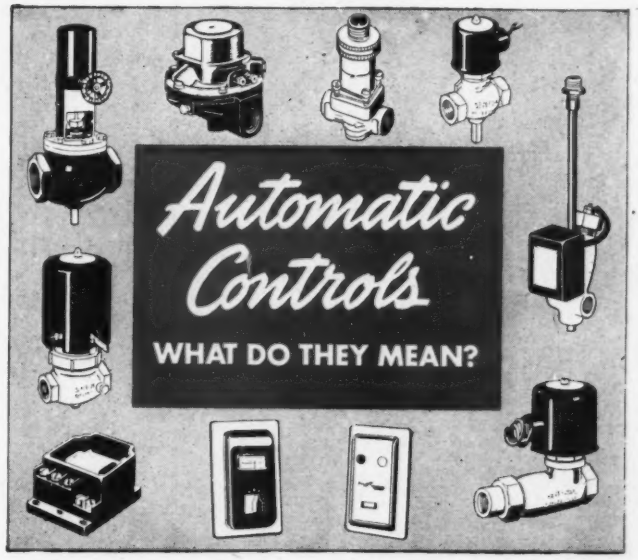
The Mohr Wholesale Supply Co., Detroit and Lincoln Park, Michigan, has changed the firm name to Wimsatt Brothers & Mohr. No change has been made in the ownership, personnel or address.

◆

Maurice De Wulf has moved his shop from Pulaski Road, Chicago, to Bloomingdale, Illinois, on a five-and-a-half acre tract, where he has converted the barn into a shop and storage space.

◆

The **Charles W. Roland Company,** Richmond, Indiana, has celebrated their 58th year of business.



Automatic controls of pressure, temperature and flow assure *pre-determined accuracy of results* wherever they are used. No thinking executive, production manager or maintenance engineer can miss the full significance of this statement.

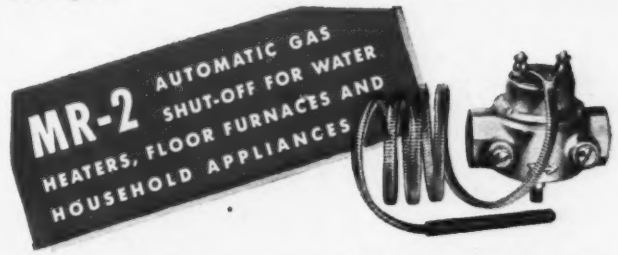
In factories and plants of every size and kind, *automatic controls* increase productive output and reduce waste by simplifying operations, speeding work, and assuring uniformity of finished product. With controls, even the most inexperienced novices quickly attain proficiency.

In homes and buildings, large and small, *automatic controls* promote economy, comfort, health by providing optimum temperature and humidity, saving fuels and doctors' fees.

On stationary equipment such as presses, machine tools, internal combustion and diesel engines, *automatic controls* save materials, plumbing, space, time and money.

On moving equipment such as aircraft, ships, tractors, trucks, tanks, locomotives, **hi-g** *light-weight controls* assure efficient performance because they operate in any position, regardless of vibration, change of motion or acceleration. **hi-g** saves weight and space.

Although now engaged full-time in supplying war needs, General Controls' staff of "straight-thinking" engineers invite your request for help in solving your post-war control problems. For complete description of General Controls' broad line of automatic pressure, temperature and flow controls, write for Catalog 52.



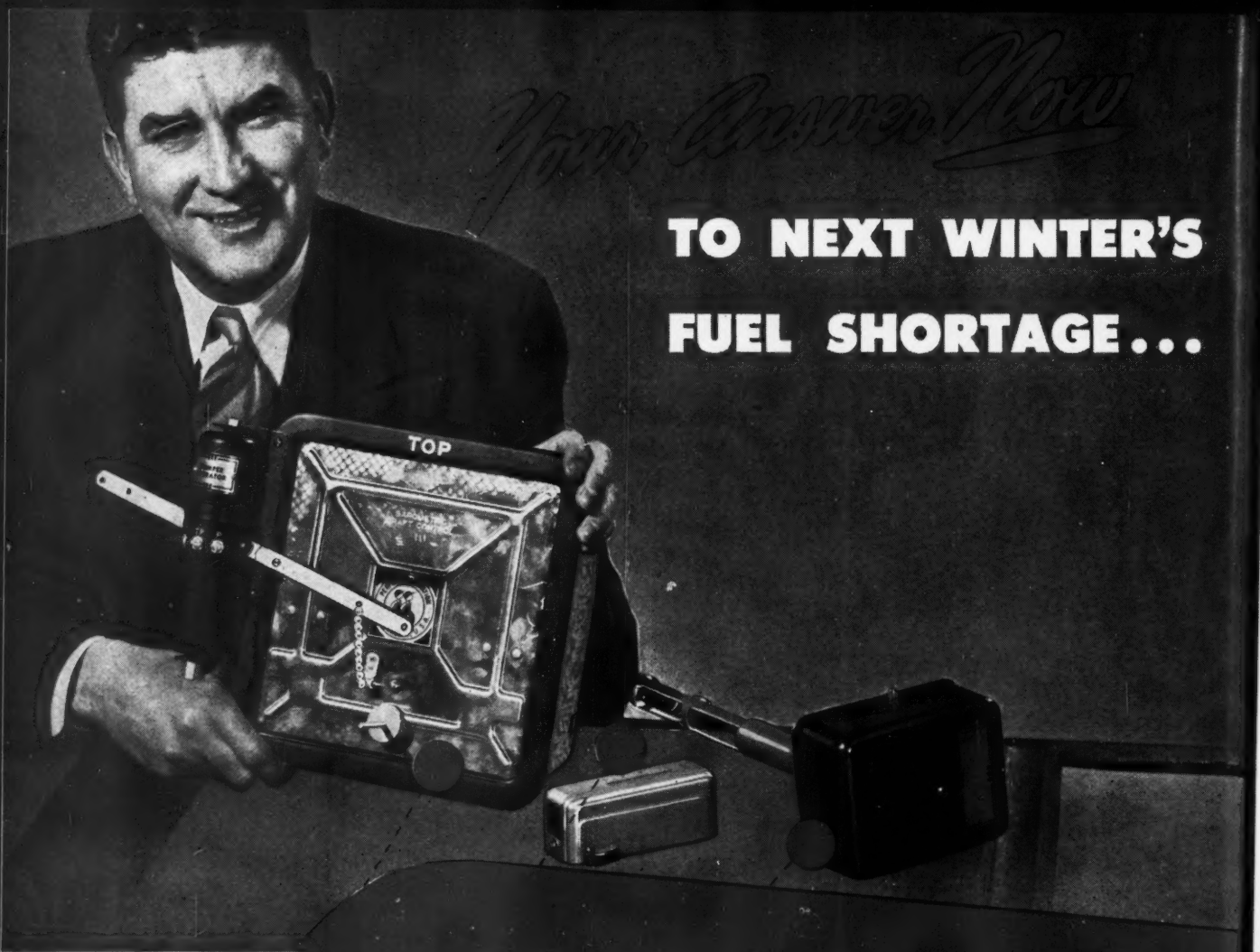
Necessary valve operating current is supplied by heat of pilot flame applied to thermocouple element. Failure of flame automatically closes valve which can be again opened by convenient push button. MR-2 is straight through gas type. Standard thermocouple length 30". Valve sizes: ¾" to 1½". Available for manufactured or liquefied petroleum gases.

GENERAL CONTROLS

801 ALLEN AVENUE, GLENDALE 1, CALIFORNIA

BOSTON • NEW YORK • PHILADELPHIA • DETROIT

CHICAGO • CLEVELAND • DALLAS • DENVER • SAN FRANCISCO



You Answer Now

TO NEXT WINTER'S FUEL SHORTAGE...

Perfex COMBUSTION CONTROL SYSTEM

with Thermostatic Regulation

Here's a new high in fuel-saving, convenience and dependability for hand-fired heating. Many remarkable new performance features are embodied in this system—not only through its complete, precise co-ordination of control operations—but in the basic design of each unit. Yet every unit is performance-tested—will deliver consistent, long-life satisfaction. It's priced for volume installation. Write today for information and be ready for the big demand just ahead.

ONE COMPLETE MATCHED SET

- *Draft Control* has lightweight square vane pivoted on new rolling spring-type hinge, and mounted in square channel. Greater sensitivity and air intake, longer life, vane hinge won't stick or clog. *Attached Damper Operator* uses hydraulic action—no noise, no gears or ratchets to wear and fail. Safety cut-off for power failure.
- *Thermostat* features "Magic Dial." Handsomely styled.
- *Limit Control* furnished for steam, warm air or hot water. Easily accessible for adjustment. Rugged, long-life construction.

Fuel-Saving Starts With CONTROL

Perfex CORPORATION
420 W. OKLAHOMA AVE.
MILWAUKEE 7, WISCONSIN

Amendments Interpretations

(*Continued from page* 53)

the statement set forth in paragraph (d) (1) above must also be used.

(4) The use of the allotment symbol N-O or W-6 will not be limited to any particular month or quarter and, therefore, no quarterly identification need be shown when using it. Authorized controlled material orders must, however, show the month in which delivery is requested. The allotment symbol and rating may not be used by the builder, contractor or subcontractor in placing orders after the expiration date of the project but delivery after such date may be specified on orders placed before then.

(5) The allotment symbol and preference rating must not be used to order materials in greater quantities, or on earlier dates, than needed for the construction. It may be used not only to order materials needed for the construction but also to replace in inventory materials used for the construction. Attention is called to CMP Regulation No. 2 which places a restriction on inventories of controlled materials.

◆

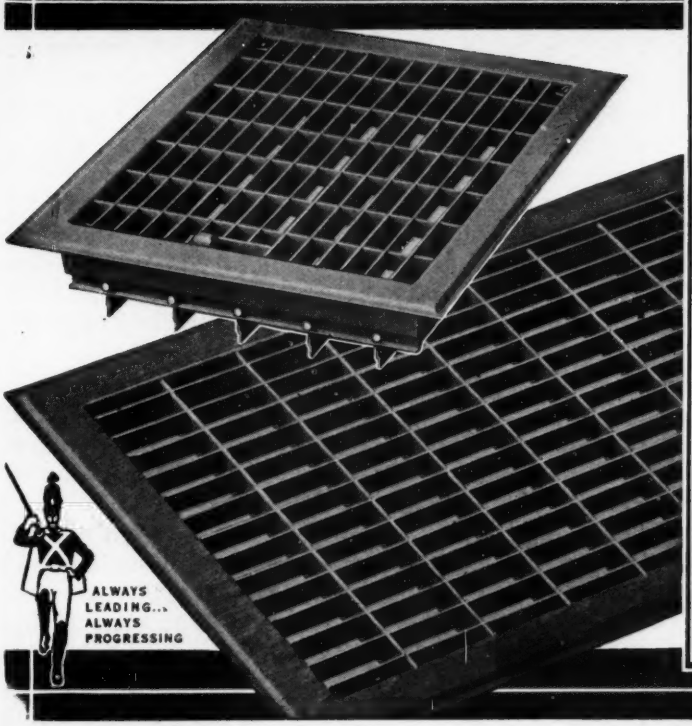
Holland Furnace Fined

REPORTS the St. Louis Better Business Bureau in its Bulletin of April 4: "The Holland Furnace Company and R. W. Line, manager of the company's branch at Altoona, Pa., were fined a total of $18,000 in a Federal Court in Harrisburg, Pa., January 4th, on three counts of violating WPB priority regulations. Judge Albert W. Johnson directed the company to pay $5000 on each of the three counts and Line to pay $1000 on each. The prosecution was in charge of Floyd Cook, special assistant to the Attorney General of the United States.

"The government charged that Line certified to his home office that certain persons were eligible to buy furnaces from him and that the purchase papers were approved by the home office. Counsel for the company said in court that it was extremely difficult for the company to know that all papers sent in by branch managers were in order. However, he stated that the company assumed full responsibility for the acts of branch managers and that he was willing to grant that the punishment was fair.

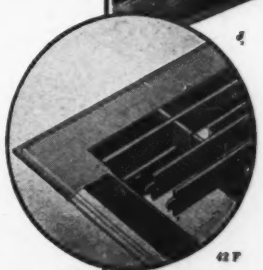
"Apparently, the government chose incidents that occurred at Altoona from the mass of evidence indicating violations in other cities, that was at its disposal. While the company has denied any intent to take advantage and, after criticism assumed national proportions and came to the attention of government agencies, has issued certain instruction to its employees with the avowed intention of preventing wrongful practices, we feel it is to blame for devising a sales program that was almost an open invitation to questionable practices because of the temptation to commission-hungry employees, inherent in the plan. Judging from reports of the income of some of the branch managers, selling Holland furnaces was a highly satisfactory enterprise especially under the 'scare the customer into buying a new furnace' program which was the chief factor in making sales."

INDEPENDENT "Fabrikated" REG. U. S. PAT. OFF.



REGISTERS AND COLD AIR FACES

We are continuing to supply Independent Registers and Grilles for military needs, also for maintenance and repair when orders are properly rated and certified. For other purposes we can often fill a requirement from stock either as specified or with an alternate approved by our customer. We welcome your inquiries.



THE INDEPENDENT REGISTER CO.
3747 E. 93d St., Cleveland, Ohio

42 F

More and More Furnace Men are Saying Just this About FIRELINE

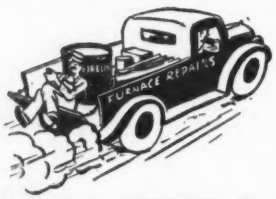
"When the scarcity of firepot castings first became serious, I was plenty worried. Now, in one respect, I'm glad it happened. It taught me things about repairing furnaces that will make me real money for years to come.

"I've found out, for example, how Fireline does a great job of restoring cracked and burned-out firepots. That solved the casting shortage problem. But even if I could get casting whenever I want them, I'd still use Fireline—and that's what I'm going to keep right on doing when things get back to normal. With what I know about Fireline, I'd say the Fireline way is the answer, war or no war.

"Profits? No question about profits with Fireline. Fireline jobs are fast and easy, and the percentage is much higher per job than in new firepot installations. I can handle far more work with the same manpower and I have better satisfied customers. Therefore, I make more money. No dismantling of furnaces or waiting for parts or trying to get something special. Fireline "fits" any make or size of furnace, and it's always available.

"Yes, Fireline has been a life-saver in war time. It will be a standby any time."

KEEP A DRUM ON THE TRUCK



FIRELINE FACTS

Fireline lining seals all cracks and holes in firepot castings . . . prevents escape of gas, odors, and dirt into building. A Firelined furnace gives more heat from less fuel. Ideal for new furnaces to protect and preserve firepot castings. In steel furnaces, Fireline repairs or replaces fire tile lining. Write for bulletins, prices and name of nearest jobber.

FIRELINE STOVE & FURNACE LINING CO.
1816 Kingsbury St. (Dept. F), Chicago 14 Illinois

FIRELINE
STOVE & FURNACE LINING

Heavy Plate Demand

CURRENT demand for steel plates is heavier than at any time since the war began, the *Iron Age* reports.

The magazine said pressure for steel from military agencies indicates that the high level of industry activity will show little slackening. It reports ammunition, lend-lease and other government requirements seem to be mounting.

This week's national steel ingot operating rate is estimated at 97 per cent of rated capacity, down half a point from last week's rate, the publication said:

"Mill overloads, particularly in flat rolled products, are reported resulting in many broken delivery promises. The jam in the semi-finished steel market has been intensified by new lend-lease requirements."

◆

Refrigerated Spot Welding Electrodes

(*Continued from page* 82)

used and the essential features are illustrated by the schematic diagram, Fig. 31.

The high-pressure side was a self-contained closed direct expansion unit, and the refrigerant in the primary side is freon.

The expansion coils are immersed in a steel tank which holds a calcium chloride brine solu-

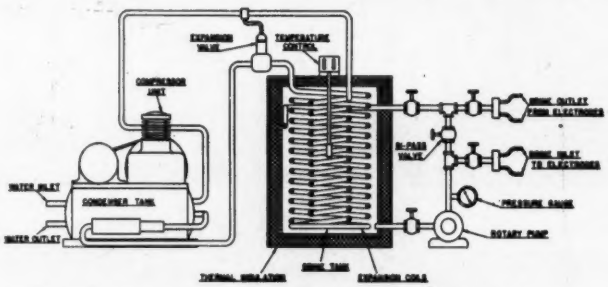


Fig. 31—Schematic Diagram of Refrigerating System

tion. The evaporator coil consists of about 150 ft. of ¾-in. iron pipe. The brine tank was 20-in. diam. by 36 in. deep inside and held 36 gals. The temperature of the brine is controlled by a thermostat well immersed in the center of the brine solution.

The cooled brine solution was forced through the electrodes and back to the brine tank by a centrifugal pump. The inlet pipe was so arranged as to provide a swirling and stirring action to the brine around the evaporator coils.

In operation the by-pass valve shown served to regulate the pressure and rate of brine flow through the electrodes. When the electrodes are to be removed from holders for replacement, the pump motor was shut off and the inlet and outlet valves closed. A small drain stopcock was used to drain the brine from the holders. After the

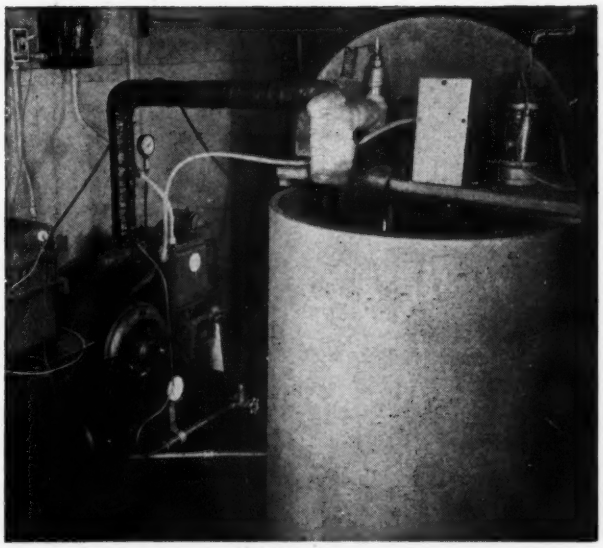


Fig. 32

tips were removed the holders, and particularly the holder tapers, were flushed out carefully with warm water.

In order to prevent freezing of the calcium chloride solution at temperatures as low as —45° C., the concentration of the salt was adjusted to obtain a specific gravity of 1.275 gm./cc. to 1.280 gm/cc. measured at 15° C.

In a commercial installation the specific gravity of the brine is maintained as low as practical in order that the solution may have a minimum viscosity. With a specific gravity of 1.275 gm./cc. at 15° C., the specific gravity of the brine at —40° C. would be 1.300 gm./cc. Relative viscosities of the brine solution with water are given.

Fluid	Temp., ° C.	Specific Gravity, Gm./Cc.	Viscosity in Centipoises
Water	20	0.9980	1.005
Brine ($CaCl_2$)	—40	1.300	14.0

A photograph of the refrigeration system is exhibited in Fig. 32.

Salt brines, although cheap and readily replenished, are very corrosive and rapidly deteriorate most base metal materials. Brine deposits allowed to remain on welder parts may cause serious corrosion, impairing the mechanical or electrical functions of the equipment.

Furthermore, the calcuim chloride brines have a disadvantage in throwing out insoluble precipitates with untreated waters. In both sodium chloride and calcium brines if the concentrations exceed 23% and 33%, respectively, solid salt may deposit out. The corrosive action of the salt brines may be reduced by the addition of certain chemical buffers and protective colloids.

Other solutions, many of which are no more corrosive than water, may be used as circulating refrigerants. Some of these are alcohols, acetone, carbon tetrachloride, methylene chloride, glycerine and ethylene glycol (prestone).

DIRECTHERM

DIRECT-FIRED UNIT HEATERS

GIVE FLEXIBLE HEAT

WHERE, WHEN, AND HOW YOU NEED IT

For permanent or temporary, for additional or emergency heating. Can easily be moved to other rooms or buildings. Automatic controls prevent heat-wastage. Direct heat outlets save fuel. Powerful blower spreads heat evenly without draft. May we give you detailed information on this flexible and economic way of heating?

AIRTHERM MANUFACTURING CO.

706 SOUTH SPRING AVENUE, ST. LOUIS 10, MISSOURI

On Our Industry's Front

(*Continued from page 57*)

the *current* stumbling block in permitting the easing up of any so-called civilian production. Everything seems based on the carrying out of the invasion successfully and as planned. Many conferences have been held and many people in high places are in sympathy with the program. A powerful and factual story has been told about the good which can be accomplished in the savings of fuel, transportation and labor with the installation of the small sizes of stokers, but WPB's job is to balance these advantages against the disadvantages and the urgent and authoritative demands from the military for manpower and materials in eventually arriving at a decision. We have pleaded that time is short; that the industry needs advance notice in order to get under way before the next heating season starts.

◆

Drop Hammer Forming

(*Continued from page 77*)

the punch (about 15 inches long) holding the part in the right position. With the next dropping of the hammer about 1 inch deeper, and again feeding by from 4 to 5 inches at a time, the curvature of the punch will become more pronounced and the strip will just slide along, its formation determined by the 15 inch long punch on which it slides. Thus, by dropping the hammer deeper and deeper as the work requires, and feeding-in gradually, the part will, under the final hits of the die over the punch, assume a smooth, true to form shape. Wood blocks sawed to fit the punch are progressively used.

This same "feeding-in" procedure will form a strip of metal to a certain contour laterally and shape it upward, forming a circular contour of the part across its lateral form. In other words, if we wanted to form a portion of a ring in the drop hammer, the ring contoured as shown under (Q) in Fig. 4, we would apply the gradual feeding-in process. But in this case the punch (J) would be radial vertically, with its middle portion elevated above the platform, and the platform itself allowing for the forming part to reach over it at front and back. In this work it might be advisable to change the dies once the part has been pre-formed enough to repose in the female die.

What Can Be Done in a Drop Hammer

Forming in the drop hammer is largely a matter of starting with the right kind of information as to how to make the dies advantageously and how to use various aids such as wood blocks, rings and other material to prevent excessive wrinkling and subsequent tearing of the metal in spots so wrinkled. The operation of the hammer will come with experience, the operator learning by mistakes made in trying to form a part too quickly, at one operation, or forgetting to use grease, or mounting the dies carelessly, or one or the other "slips" liable to occur. Dies must be mounted with precision, and this is best done by inserting equivalent thickness of the stock to be worked in the female dies and setting the punch tight upon such metal strips before the dies are fastened tight. Pieces of leather or cardboard are satisfactory in this con-

Out of the Desert:

the principle of Artic-coolness through evaporation

The ancient Arabs used porous skin bags to cool water by evaporation. The Palmer Manufacturing Corp. has spent over thirty years perfecting the principle of evaporative coolers for the home, and manufacturing coolers, in the desert of Phoenix, Arizona.

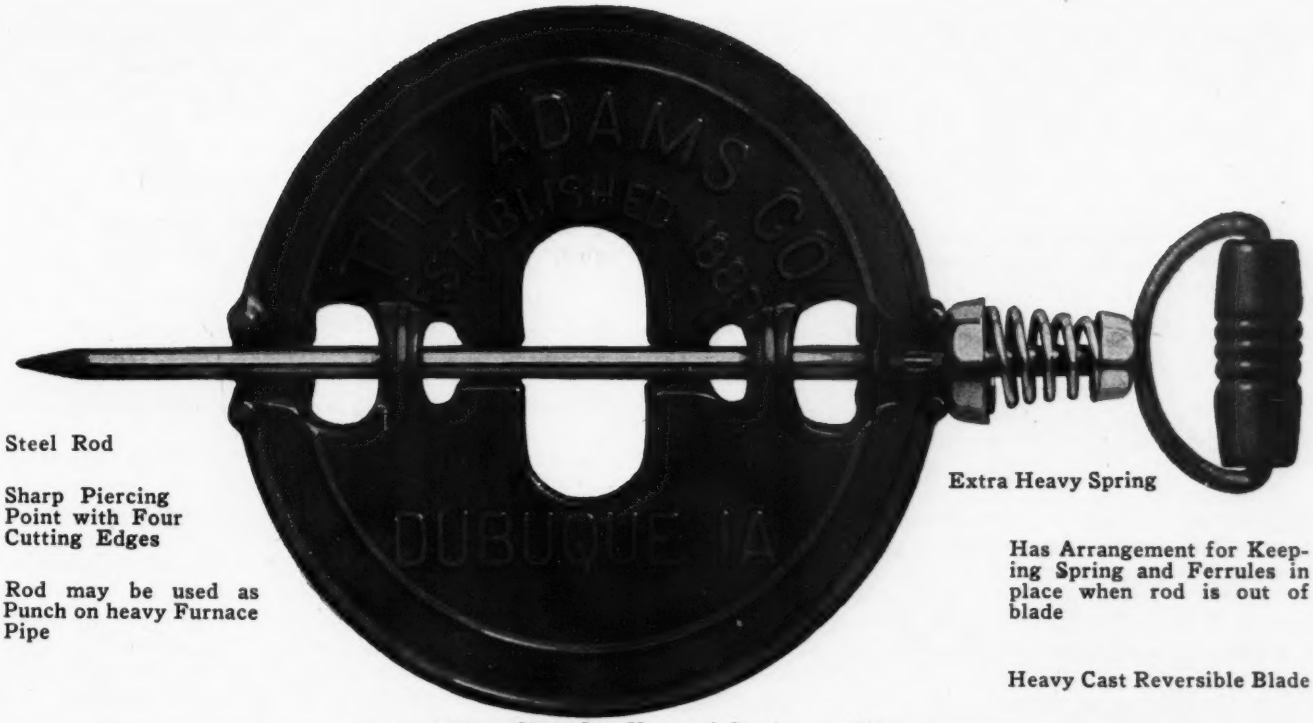
FROS-T-AIRE
COMFORT COOLING

is the name of the modern miracle cooler by Palmer that is bringing comfort to the homes of thousands of essential workers, military personnel, and invalids. Available in horizontal, upblast and downblast, all types and sizes. 2500 CFM to 30,000 CFM.

WRITE FOR PRICES AND PRIORITY INFORMATION!

Horizontal Model

Palmer
MANUFACTURING CORP., PHOENIX, ARIZONA



Steel Rod

Sharp Piercing Point with Four Cutting Edges

Rod may be used as Punch on heavy Furnace Pipe

Extra Heavy Spring

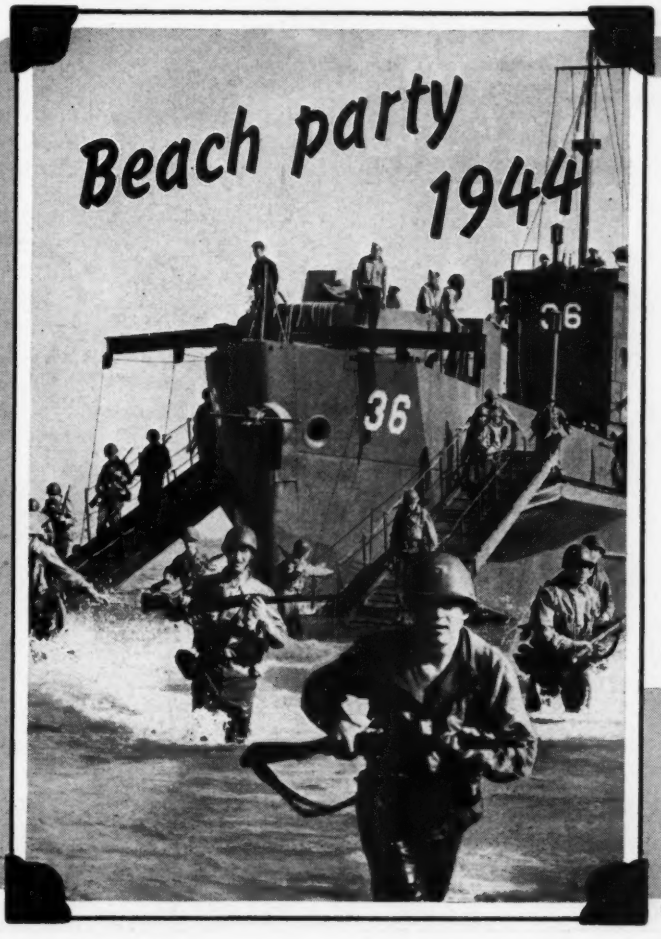
Has Arrangement for Keeping Spring and Ferrules in place when rod is out of blade

Heavy Cast Reversible Blade

• 1883 — Sixty-One Years of Service — 1944 •

ADAMS DIAMOND SMOKE PIPE DAMPER

MANUFACTURED BY
THE ADAMS COMPANY
DUBUQUE, IOWA, U. S. A.



U. S. ARMY SIGNAL CORPS PHOTO.

No picnic, this! . . . but a grim game of kill or be killed on enemy shores. While the fighting rages, PAYNE must bend every effort to help win. But after victory, we'll turn again to furnaces, featuring . . .

Payne ZONE-CONDITIONING

Post-war successor to old-fashioned central heating. ★ Healthful circulation of fresh air, gas-heated in winter; cooling, refreshing in summer . . . *controlled by zones or individual rooms.* ★ Meanwhile, let's back our boys on the beaches with *everything.* ★ Let's buy more Bonds.

GAS FUEL DOES EVERYTHING

PAYNEHEAT

NEARLY 30 YEARS OF LEADERSHIP

Payne FURNACE & SUPPLY CO., INC.
BEVERLY HILLS, CALIFORNIA

nection, but the strips of this material must be of equal width and slightly thicker than is the stock to be worked. A preliminary, gradual working of the hammer into the die, with the strips of leather or cardboard pasted to walls of cavities, will show whether the punch strikes uniformly or needs adjustment.

As the operator gains experience in making drop hammer dies and forming sheet metal parts in the hammer, he will see the possibilities this mode of forming opens up as he advances in its employment. Practically anything that can be done in a draw press can be done in the drop hammer. Many things can be done in the drop hammer which cannot be done in the press. Especially if we consider the possibilities presented by the "feeder" forming in the hammer, as shown in Fig. 4. Once the operator becomes familiar with this method of shaping metal to multiple curvatures, he will devise his own means of facilitating the work and doing it at a quickened pace. Drop hammer forming, although used half a century ago to make "panels" for the hand-built automobiles of that time, is still in its primary stage. The draw press, and lately the Stretcher and the Hydro-Press, have obscured the usefulness of the Drop Hammer. But it has been found that the hammer will do work which the other means will not.

Its full usefulness has been recognized only in the aircraft industry, where it is employed to form parts of heavier gauges; also sharp-contoured shapes impossible to do in the Hydro-Press. In fact, much of the Hydro-Press work is being put to final contour in the drop-hammer. This combination, pre-forming in rubber and then finishing up in the drop hammer dies, has the advantage that no "draw rings" need to be employed, as the rubber itself will largely prevent wrinkles forming against the pressure of rubber from all sides. But irrespective of the above practice, applying principally to light gauges of metal which the rubber will form, the Drop Hammer has a pronounced usefulness in that it will work light and heavy gauges alike, from first to last contouring, and will produce exactly such formature as the dies call for.

◆

Use and Care Of Paint Brushes

(*Continued from page* 83)

cramps or stretches the arm and speeds up fatigue.

There are times, of course, when it is not always practical to handle the brush in the manner suggested or to stand in the most comfortable position, but the time spent in preparing the work so that the painter can work most efficiently is well repaid by the added work that can be done without fatigue. Strokes should be kept reasonably short, about 24 to 30 inches so that enough paint is left at each end of the stroke to flow into the paint applied on the overlapping strokes.

When getting ready to paint, the brush should be dipped into the paint about two inches and the excess scraped off against the stirring paddle or the edge of the container. This should be done several times so as to work the paint well into the bristles and to give the brush a greater carrying capacity. Finally dip the brush into the paint and start the application. Avoid loading the brush up to the ferrule with paint

STAKE YOUR CLAIM
In This EXTRA-DESIRABLE Field

Two and a half million home-owners in this section (one of the wealthiest, most thickly populated in the country) burn hard coal. With increasing emphasis on comfort, convenience, cleanliness and automatic control, a tremendous number of them are ready-made prospects for automatic anthracite stokers.

NOW is the time to stake YOUR claim to a franchise so you may be sure of your share of the inevitable post-war stoker business. BE READY to meet the demands that are sure to flood in the moment war-time restrictions are lifted . . . AT A GOOD PROFIT!

The HARD COAL Area
This is the anthracite producing and consuming area . . . a mine of good business prospects for YOU!

GET ON YOUR TOES FOR POST-WAR DEVELOPMENTS

Our brochure, "OPPORTUNITY", soon to be released, will tell you about selling plans, dealer helps, and a complete line of coal burning equipment developed from the experience of fifteen years of domestic anthracite stoker specialization. SEND US YOUR NAME FOR OUR MAILING LIST.

C M W
CATSKILL METAL WORKS, INC. CATSKILL, N.Y.
ONE OF THE LARGEST PRODUCERS OF ANTHRACITE STOKERS

as this causes dripping and spattering, making even coats impossible and wasting paint.

As has been mentioned before, most metal paints should be laid on with an arc-like stroke, and then left alone so that the coating can flow, thus eliminating brush marks. Whenever possible paint should be applied with horizontal strokes, even into corners, and if the brush has been properly cared for, this picking up in the corners can be done easily and neatly without fingering or spattering.

The Care of Brushes

The amount of work that a painter can turn out depends to a great extent upon his own manual skill in handling the brush, but like any other tool, the brush must be kept in good condition. No painter can cover as many square feet if he uses a worn or flared brush. That is why considerable attention should be given to the proper care of brushes. Actually, brushes which often appear to have been given adequate care are not properly cleaned, leaving an unnoticeable film of paint, varnish, or enamel on the bristles. This film impairs the natural flexibility of the bristles, retarding the flow of the material and slowing up the work and reducing the amount of surface that can be covered in a working day.

To clean a brush properly need not be a messy job, though, of course, it will take time, but this time is well spent because the painter is able to work more rapidly and efficiently with a clean brush. First step in cleaning is to pour an inch or two of thinner into a wide, deep pot. Press the brush, flat side down, into the thinner so that the liquid is forced well up into the heel. When the thinner has been worked in well on both sides of the brush, suspend the brush over the pot by holding the handle between the palms of the hands, then move the hands back and forth so that the brush will rotate first in one direction and then in the other. Rapid spinning in this manner will force out the thinner and the loosened coating material.

Should any of the paint adhere to the brush, the bristles may be scraped with a dull putty knife, after which the brush should be dipped in the thinner and dried as before. Then with a stubby sash brush, which has been dipped in thinner, scrub out all loose paint from between the bristles. When doing this, work from the ferrule to the flag end of the brush. Finally, rinse the brush in clean thinner, dry it by twirling between the hands, and then soak it with linseed oil and wrap it in heavy paper. Wrapping brushes even though they are to be used on the following day is considered a wise procedure as it prevents them from flaring and losing their shape as they will do if suspended in linseed oil. Experiments have shown that brushes which are wrapped retain their chisel and will coat a given space in about ten per cent less time than similar brushes that have lost their chisel by being suspended in oil rather than wrapped.

As has been pointed out, brushes that have been carefully selected, well handled, and properly cared for, can be depended upon to speed up the work and keep the costs to a minimum. The following ten rules, if observed, will do much to protect the brushes and consequently help in turning out the work in the shortest possible time.

Ten Suggestions for the Care of Brushes

1. Paint only with the flag end of the brush.
2. Don't pound or daub a brush into corners or other surface irregularities.

Fuel-Saving Starts With CONTROL

Field Barometric DRAFT CONTROL

★ The delicately balanced, but strongly built Field Barometric Draft Control compensates immediately for the slightest change in barometric pressure. Through all types of weather, it maintains the minimum draft necessary for proper combustion.

★ A Field Control provides fuel savings ranging up to 25%. There is a model adapted to any type or size of heating installation . . . coal or oil. The domestic controls can be installed in as little as thirty minutes; installation requires only a tin snips, a carpenter's spirit level, a little "know-how."

★ Write today for full, free facts. The profit margin on a Field installation is definitely worth while. They require no servicing. The market in your community is almost unlimited, as nine out of ten installations need a money-saving, fuel-saving Field Barometric Draft Control.

FIELD CONTROL DIVISION MENDOTA, ILLINOIS

3. Don't use kerosene for cleaning brushes.

4. Water should not be used on brushes.

5. Never submerge the entire bristle into the paint.

6. Don't use a large flat brush on round surfaces such as pipes.

7. Use the right brush for the job—a small one for a small or narrow surface and a large one for a large surface.

8. Clean brushes carefully and wrap them before soaking them in linseed oil.

9. Never use a brush edgewise.

10. Use a worn brush, not a new one, for the first and second coats on rough surfaces.

◆

Humidity and Control Clinics

(*Continued from page 72*)

Hourly B.t.u. Heat Loss of House	*Daily Evaporation Requirements (min.) (gals.)*
50,000	3
75,000	4.5
100,000	6
125,000	7.5
150,000	9
175,000	10.5
200,000	12

The values suggested were to be subjected to further checks to take into account all types of building construction. The group desires that such information, when finally approved, be included in Table 4a of the Forced Air manual.

5. The group gave consideration to a standard method of testing and rating humidifier devices by the manufacturers of such devices. The numerous factors affecting maximum evaporation rates were considered, and the following tentative standards were set up:

(a) Distilled water to be used as a basic medium that can be duplicated. Later studies will be necessary on effect of mineral content of water.

(b) Bonnet air temperatures during test to be 165 deg. F. for forced air conditions and 200 deg. F. for gravity conditions. Both temperatures were in line with prevailing furnace test codes.

(c) Evaporation to be weighed only after plant has attained temperature equilibrium under continuous firing.

(d) Inlet air temperatures to between 65 deg. and 75 deg. F. (dry bulb).
Inlet relative humidities to be between 25% and 40%.
Some attention to be given to correction factors required for variations in the inlet air conditions.

(e) Temperature rise through furnace unit to be 100 deg. F.

(f) Average approach velocity to humidifier device to be 400 ft. per minute.

(g) No specifications to be set for entering water temperature.

(h) No agreement was reached on type of furnace to be used as standard heat generating device.

6. The humidity manufacturers in general are seeking as an overall objective the following items. It is desired:

(a) That the furnace industry appreciate the demand on the part of the public for adequate humidity.

(b) That the public be informed on the facts about humidity.

(c) That the furnace industry seek to provide means

REMEMBER the airplanes, the old Jennys and De Havillands of the last war? Well—people just don't fly them any more. They wouldn't be much protection against modern planes, would they?

With Furnaces as with Planes you need ruggedness and mechanical perfection *not* known a few years ago.

Firepower in Airplanes — the thing that helps win wars, can be translated and called merchandising power in Syncromatic furnaces. Through Syncromatic's high efficiency, your customer will know that his home instead of its chimney is getting his fuel dollars.

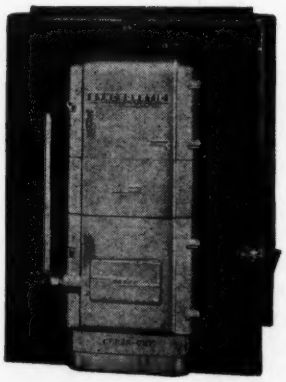
With Syncromatic you not only get the *best* but also the most *Modern.*

Syncromatic

STEEL FURNACES

Gravity Forced Air

Rugged! Compact! Smooth!



CF227, GRAVITY

From Coast to Coast—men who appreciate Quality and Value use Syncromatic All the way.

Syncromatic Corporation

3373 N. Holton St. Milwaukee 12, Wis.

CHAR-GALE "Pre-Fabricated" DUCTS AND FITTINGS

PRE-FABRICATED DUCTS

Already engineered to save you time and trouble. The Char-Gale "Quick-Method" Chart gives accurate sizes for any job, and figures costs for you.

SMOKE PIPE

After years of field experience, we find that the trade generally agrees that the double offset lock, which we call the *Char-Gale* lock, seems to be the most satisfactory.

ELBOWS

Char-Gale Elbows have earned an enviable reputation with the trade — easy to adjust, segments are extra large and cannot come apart.

Char-Gale was a pioneer in the design and manufacture of pre-fabricated ducts and fittings for forced air and gravity heating and distribution systems. Although heavily engaged in War Work, we have never gone out of production on Char-Gale heating products.

You can make extra profits with CHAR-GALE "Pre-Fabricated" DUCTS and FITTINGS, which will handle your jobs practically 100% complete. Made by standardized mass production methods—all sizes are accurate—no delays on the job. PROMPT DELIVERIES—Try us out on your next job.

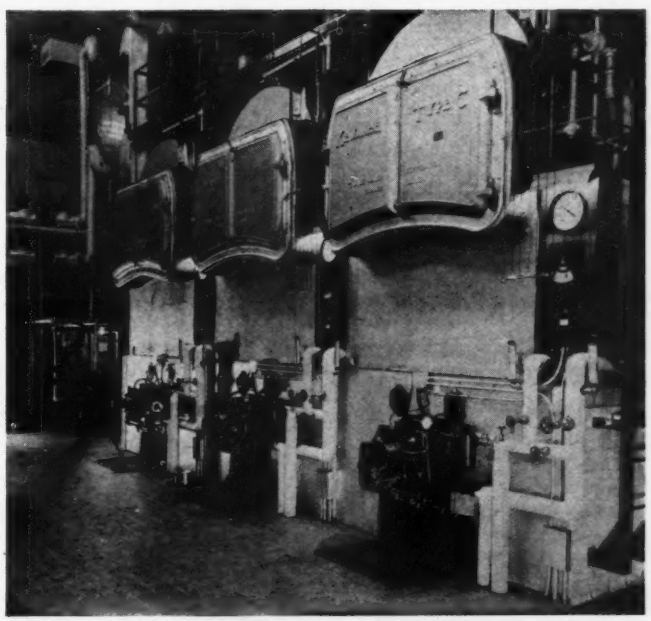
Send for CHAR-GALE CATALOG No. 40

We offer one of the most complete heating supply lines in the industry, including furnace smoke pipe and elbows, stove pipe and elbows, warm and cold air pipe, registers and register boxes, air filters, etc.

CHAR-GALE MANUFACTURING CO.
3125 HIAWATHA AVE., MINNEAPOLIS 6, MINN.

Heat for a 5-room cottage . . . or a 500-room hotel!

Johnson Burner dealers can compete successfully on any Heating Job



Whether the call is for a model installation like this one in the two-million-dollar Bankers Life Company Building (installed by Carbon Coal Co., our dealer in Des Moines) or for a lunch-room Range Burner . . . Johnson dealers are in a preferred position to get the business.

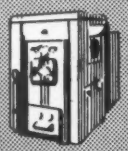
Behind them, to back up their selling, is an organization with 41 years of single-minded oil burner experience . . . an engineering staff that will help with technical problems . . . and a *complete* line that has earned the goodwill and respect of Heating Engineers and Architects all over America.

If you want a profitable post-war dealership, it will pay you to investigate the possibility of getting a Johnson Burner franchise. There are a few territories open. We will gladly give you details. S. T. Johnson Co., 940 Arlington Ave., Oakland 8, Calif., and 401 No. Broad St., Philadelphia 8, Pa.

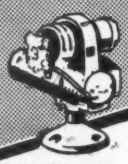
S. T. JOHNSON CO.
41 years of engineering and building fine Oil Burning Equipment

CAST IRON FURNACES

STEEL FURNACES

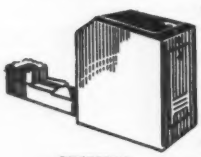


WINTER AIR CONDITIONERS



OIL BURNERS

BLOWERS



STOKERS

HUMIDIFIERS

Also:

COOLING EQUIPMENT
REGISTERS
DUCTWORK
AUTOMATIC CONTROLS

The KEY Heating Dealers Choose PREMIER as their Post-War Line

In every community you will find one or more "key" dealers. They're not necessarily the largest dealers — but, they are the alert, progressive, live-wire dealers — the men who are working and planning today for a more prosperous tomorrow. They are the dealers whom every heating manufacturer would like to have.

Here at Premier we feel proud because so many of these "key" dealers are Premier dealers . . . we are proud that we had a part in their past success . . . and, we are proud that they are relying upon us to help them achieve still greater success in the future.

We are determined too, that when tomorrow dawns, we will keep faith with all of our dealers, by giving them a still finer, more complete PREMIER line . . . by giving them still more factory assistance with their engineering and merchandising problems.

Meantime, we appreciate the patience of our dealers during this period when our furnace production is limited and our main attention must be devoted to turning out the materials of war.

PREMIER FURNACE COMPANY
DOWAGIAC, MICHIGAN

PREMIER

The Year Round Line

for actually obtaining the desired humidity. A closer cooperation between the furnace industry and humidifier industry is desired.

(d) That new homes be erected with provisions to enable desirable humidities to be maintained.

(e) That the humidifier industry seek ways and means of improving their product from the standpoint of performance, rating and servicing.

(f) That a booklet on humidity should be included in the proposed Association textbook series for dealer training.

◆

The Louisville Bid Depository Plan

(*Continued from page* 58)

(D) In the case of competitive bidding which develops on a no date job to the owner direct, the Bid Depository shall not open and tabulate the bids until after award.

(E) Except as herein provided, each division shall continue in effect its Bid Depository Regulations as adopted by its Divisional Committee.

8. *Administration.*

(A) Each branch or division of "Fair Bidding Practices" shall elect a Divisional Committee, which is authorized to manage the affairs of the Division, to investigate and hear complaints and to adopt working rules in conformity to conditions herein outlined.

(B) Each Divisional Committee shall elect a chairman. The Chairman of the several Divisional Committees shall be known as the Coordinating Committee, which is authorized to hear appeals from decisions of the Divisional Committees, to collect dues, to make rulings and interpretations, and to exercise general management of "Fair Bidding Practices."

(C) The Coordinating Committee shall select a Chairman and a Secretary-Treasurer and may employ a field agent.

9. *Financing.* Each subscriber to "Fair Bidding Practices" shall pay a fee of ¼ of 1% on all building construction work he is awarded through competitive bidding to be executed in Jefferson County, Kentucky. All fees are due and payable at the end of the quarter in which work is awarded. All fees shall be payable to the Secretary-Treasurer of the Coordinating Committee, who shall keep an accurate accounting of all receipts and disbursements.

10. *Amendments.* This document may be amended by the favorable vote of two-thirds of the whole membership of the Coordinating Committee following due notice and hearing. Any proposed amendment must be presented in writing by a Divisional Committee.

11. The privilege of becoming a subscriber to "Sub-Contractors Fair Bidding Practices" is extended to any branch and to any sub-contractor not listed in the undersigned branches who is recognized as a contractor reasonably skilled in his respective sub-trade. All applications shall be made in writing to the Divisional Committee. Upon approval of the Coordinating Committee, the applicant shall attach his signature to and be recognized as a subscriber to "Fair Bidding Practices." Any subscriber may withdraw his signature upon 30 days written notice.

We, the undersigned, voluntarily subscribe to the above plan, firm in the belief that it will be beneficial to all concerned, including the owner.

(Signed) J. E. MERRICK,
Chairman.
(Signed) J. C. SNYDER,
Secretary-Treasurer.

FRONT RANK Says:

THUMBS DOWN on the Direct-Draft Damper!

FRONT RANK *Furnaces Have the Features! Look for more in future ads.*

HEATING FRONT RANK SYSTEMS

40 Years' Experience Back of this Successful Crescent Radiator

THAT troublesome gadget, the "direct-indirect" damper, has been entirely eliminated in the super-efficient FRONT RANK crescent radiator.

As a result, this improved radiator not only assures the long fire-travel so necessary for efficiency, but also positive draft, without which a damper would be required.

In the above cut-away illustration, note how the flow of the hot gases is controlled throughout its long travel—how the gas passages are proportioned just right to cause a positive draft—how the cleanout is shaped and located to enable the home-owner to easily keep the radiator surfaces clean.

Dealers—FRONT RANK has the features that mean Sales and Profits for YOU. And it has the facilities to capably serve you NOW. **Order from your Jobber.**

FRONT RANK FURNACE CO.
DIVISION OF LIBERTY FOUNDRY CO.
2500 OHIO AVE., ST. LOUIS 4, MO.

MASTER TEMPERATURE CONTROLS

I.C.I.

READY TO ADVANCE WHEN THE WAR JOB IS DONE

Our engineers, mechanics and management brought to our war jobs the successful experience of more than a quarter of a century in the making of precision temperature controls. It was gratifying to have this war work confirm our faith in our ability to meet the most exacting requirements.

During these war-busy years, we have learned much—and we shall carry over this increased initiative and skill into civilian production in the future. Without detracting from our war effort, we have planned for postwar progress . . . worked out improvements in our products and devised new precision instruments. The "Master" mark on future temperature controls, that you may use or sell, will mean greater comfort and longer service. We are looking forward to the day when we may invite you to share this future with us.

Let us hasten the war's end by buying all the War Bonds we can.

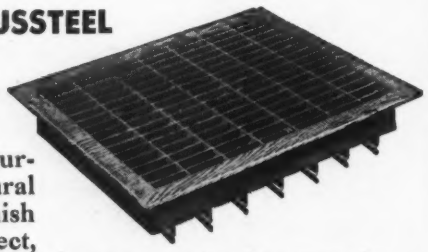
WHITE MANUFACTURING CO.
2368 University Ave. St. Paul, Minn.

NO. 256 4-WAY FLOW A-C REGISTERERS

WE ARE PRODUCING under W. P. B. Limitation Orders EVERY REGISTER and RETURN AIR INTAKE WE ARE ALLOWED TO PRODUCE.

Number 256 4-Way Flow AIR-CONDITIONING REGISTER is the up-to-the-minute design engineered to take full advantage of the latest improvements in forced air heating. Vertical grille bars adjust easily to desired flow with bending wrench as shown. Lever-operated horizontal rear valves for up or down deflection.

No. 400 TRUSSTEEL FLOOR REGISTERS



Attractive, durable natural wood finish and perfect, smooth seamless corners make this one of the best-looking grid-type registers available. Multiple Valves are assembled the short way for easier operation and also prevent air currents from soiling walls. Lever operating in ONE-MESH space in center of long side eliminates old-style end-slot. Bevel-edged, heelproof, easy to install.

Send for our latest catalogs of Gravity Registers, Air-Conditioning Registers, Pipes and Fittings.

UNITED STATES REGISTER CO.
BATTLE CREEK, MICHIGAN
MINNEAPOLIS • KANSAS CITY • ALBANY

Kruckman—New Manpower Regulations

(*Continued from page* 55)

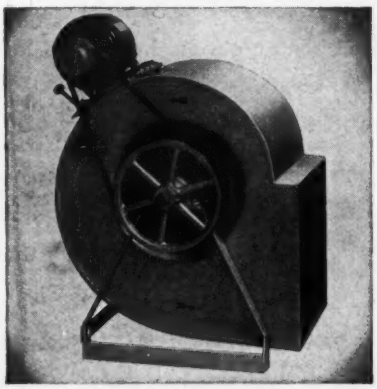
punished by "sanction," penalties in such forms as denial of quotas of materials, equipment, supplies, and of gasoline, tires, trucks, and other operating materials and facilities. It has been intimated the sanctions may take the form of cancellation of Government contracts.

The worker is protected in his right to be represented by his union. The average working time is set at 45 or 48 hours per week. Either directly or indirectly wage minima are indicated. The worker who declines employment is offered several alternative opportunities. If, finally, he refuses all jobs offered, either at home or at a distance, he will, apparently, be placed in a position where he cannot obtain any job. Employers logically will not expose themselves to sanctions that might cost $1,000 fine or withdrawal of their needed supplies and facilities. The thought seems to be that the recalcitant worker eventually will find hunger a hardship that will induce him to take any job. Only those workers incapable of taking essential jobs may work for unessential establishments.

The Pacific Coast lacks somewhere between 100,000 and 200,000 workers for essential jobs. New England lacks upwards of 100,000. The group of States around Chicago is reported to be short of unnumbered complement of workers. There are probably over-all shortages in the Southwest, and in some Atlantic Coast areas below New York. One of the primary initial objects of the "controlled referral" is to nudge

COMPACT

ECONOMICAL



EFFICIENT

EASY TO INSTALL

"BRUNDAGE BLOWER FILTER CABINET UNITS AND ASSEMBLIES are the product of specialists in the warm air blower field. Prompt delivery on various types and sizes on proper priority."

ASK YOUR JOBBER OR WRITE DIRECT TO

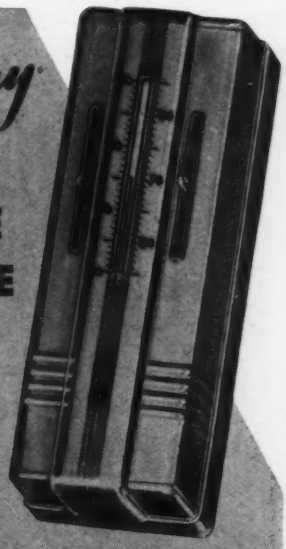
***The* BRUNDAGE CO.**
BLOWER SPECIALISTS
KALAMAZOO - - MICHIGAN

workers in surplus labor areas to the areas where there is shoratge. Apparently patriotism, plus hunger, is expected to make the nudge effective.

But the main purpose of the new plan is candidly acknowledged to clamp down on uncontrolled resumption of civilian production. The ceilings obviously will prevent employers from taking on workers; they will prevent labor hoarding; and establishments that have been cut back will not be able to use the labor that is released for civilian production. They tell us here male workers are needed desparately in plants with secret projects, and in those that make heavy artillery, submarines, and who work on ship repairs, in foundries and on forge jobs, and in coal mines and on railroads. McNutt says they are needed in rubber and tire factories, in logging and lumbering camps, in textile mills, and in the manufacture of electronic equipment. He stresses military adjustments constantly create new needs.

Donald Nelson recently stated something over $20,000,000,000 worth of war production will be stopped, during the next six months, by January, 1945. This obviously might mean many more Brewster strikes, when the cut back provoked the workers to demonstrate against Government policy, not against Brewster. It is interesting in the Brewster case that the workers, who were averaging $1.06 per hour struck because they were offered 60c to 70c per hour in jobs elsewhere. Apparently Government, as well as industry, anticipates active opposition by labor against the lay-offs that must come with the $20,000,000,000 war-work decline. Deputy Chairman and Executive Director Lawrence Appley of War Manpower Commission in his recent report to McNutt stressed: "The controlled referral system is one of the many provi-

IT'S Gleason-Avery FOR TROUBLE-FREE PERFORMANCE



• Popular G-A features include ease of installation and operation, positive safety and dependable service. The exclusive Straight Line Control, in the Gleason-Avery Damper Motor, provides smooth, accurate draft regulation. No sprockets or rotating arms to get out of order . . . no danger of overheating. Two-wire low voltage control. Finger-tip adjustment—synchronized settings—easier to set and read. Smartly styled G-A Thermostat finished in lustrous, durable Mirror-Lite.

You can recommend G-A Thermostats with confidence.

No. 130, Furnace Sentry Unit Package, for hand-fired, domestic heating plants, complete with thermostat, damper motor and all essential accessories—ready to install.

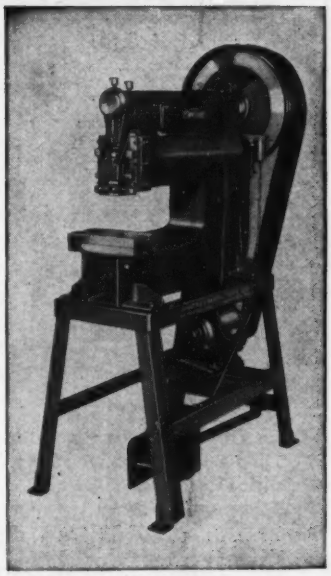
LIST PRICE $19.50

Gleason-Avery, INC.
AUBURN, N. Y.
A RELIABLE NAME IN TEMPERATURE CONTROLS

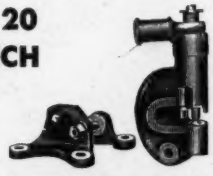
WHITNEY-JENSEN PRODUCTS
30 YEARS EXPERIENCE

POWER PUNCH PRESSES

Two sizes, 12" (No. 129) and 18" (No. 130) throat depth. Capacity 10 tons, length of stroke 1¼", stroke adjustment 1¾", die space 6". Economical small size machines for accurate work. Whitney-JENSEN construction features insure durability. Full data on request.



No. 20 PUNCH



Powerful screw press action with ball bearings in screw race gives great punching power in a light weight tool. Capacity ½" hole in ½" iron, weight only 20 lbs.

WHITNEY METAL TOOL COMPANY
91 FORBES ST. • ROCKFORD, ILL.

It's easier than ever before to sell modern roof ventilation.

YOU CAN BANK ON

Customer Satisfaction

WHEN YOU INSTALL

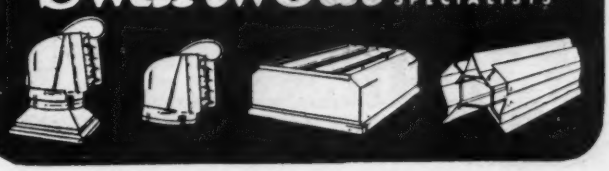
SWARTWOUT Roof Ventilators

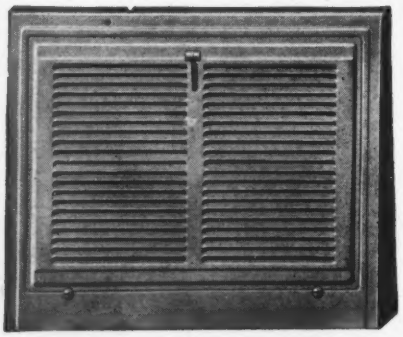
because you get positive results from them.

• Let us help you with your industrial and commercial roof ventilating problems. Write for Bulletin 214 now.

THE SWARTWOUT COMPANY, 18511 Euclid Ave., CLEVELAND 12, OHIO

Swartwout VENTILATION SPECIALISTS





Heat-Rite Baseboard Register

AUER HEAT-RITE

Latest design baseboard model which gives you ultra modern appearance and greater *open area* in a warm air register. This streamlined gravity register has slightly downward directional fins (adjustable for other levels if desired) and is made in 2-piece model, also in wall registers and baseboard intakes.

Auer offers dealers and contractors a complete line of registers and intakes for gravity and for air conditioning, and metal grilles for all purposes. Auer Registers are stocked by leading jobbers.

AUER REGISTER BOOK Auer SENT ON REQUEST

THE AUER REGISTER COMPANY, Cleveland, O.

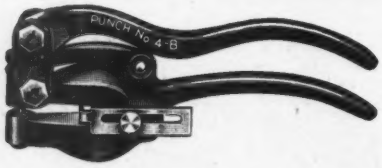
AUER REGISTERS
& GRILLES for Air Conditioning and Gravity

sions contained in local stabilization plans for guiding or curtailing the movement of labor." Washington realizes that cut backs are coming rapidly, and that lower pay is inevitable. The object of the controlled referral plan clearly is designed to prevent more and more unemployment, and to prevent workers from being left stranded without employment; first, by shouldering them into other war work, and then by gradually opening the way into some civilian production.

While WMC is putting the brakes on the employer and the worker, WPB and other agencies are cautiously making ready, at the appropriate time, to throw more of the economic machinery into production for the civilian. This does not mean the time is here; but it does mean there seem solid reasons for thinking the Nelsons and the Wilsons and the others see some glimmer of a prospect ahead. It is the first sign that has seemed to have substance, so far as this reporter's experience is concerned during the many weary months past. It is incontrovertible that very very slowly more materials actually are being released, some civilian production has been authorized, and there is a basis for the statement that more potential production has been planned.

But, at this time, the checkrein still remains manpower. No matter how much material may be available, or facilities may be idle, you cannot go into production without workers. When the manpower problem is less acute WPB apparently sees no reason why you should not manufacture furnaces, heating appliances, stoves, fans, fractional horsepower motors, water heaters, telephone sets, and a number of other articles for which the people are more or less clamoring. WPB even is thinking and planning in specific terms a certain production of passenger automobiles.

A REAL *Time Saver*



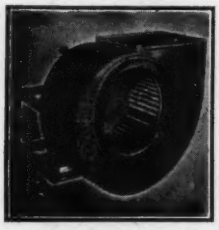
The No. 4B PUNCH
by *Whitney*

This punch is accepted by leading contractors and dealers as a real time-saver in the shop and on the job. Men who use it every day know it can't be beat for clean, fast punching. Has a capacity of ¼" through 16 ga., weight 3 pounds, 8½" in length, depth of throat, 2". Complete tool includes three punches and three dies of specified sizes with die adjusting key.

W.A. WHITNEY MFG. CO.
636 RACE ST ROCKFORD ILL

YOUR BLOWER Requirements

AVAILABLE AT
Schwitzer-Cummins Company



★ **BLOWERS FOR EVERY PURPOSE**
Double Inlet and Single Inlet

HY-DUTY Blowers, 9¾" to 25" • Top and Bottom Horizontal, and Top and Bottom Vertical Discharge • Top and Bottom Motor Mounting • Dual Units also available.

★ **CENTER DISC WHEEL**—Double Inlet, Double Width • Reinforced Center Disc • Designed for Modern Air Conditioning and Heating Applications • Sizes, 4½" to 50".

★ **ENGINEERING DATA**—Write for Catalogues showing complete Performance Data • Experienced Engineering Department available to help solve your Air Handling Problems.

BLOWER DIVISION
SCHWITZER-CUMMINS COMPANY
1145 EAST 22ND STREET INDIANAPOLIS, U.S.A.

But mark that it is not planning actual production. It is laying the basis for the production on a limited scale when the manpower is available. In all these programs the approach will be made by way of manufacture of parts for repairs and for replacement.

Aside from some specific information about materials you may have or you may know where to get, together with an estimate of what you might need, be sure to estimate how many workers you think you will need and where you might get them. And be ready to present a picture of your relation to war work in terms of contracts that have been or will be terminated. It will help if your picture shows what you were doing three or four years before Pearl Harbor. When civilian production begins it will be limited to 40 or 50 items most frequently demanded. The authority to make these items will be joined to the system of supply of copper, steel, and aluminum through the allotment channels of the Controlled Materials Plan. Notice, the controls will be maintained. This does not mean other production will be entirely restricted. It means the producer will have no help in securing materials or manpower. He will have to use his own stockpile and his own initiative. Congress and the Smaller War Plants Corporation are vigorously opposed to the historic basis, meaning that they do not feel production should be restricted to those who have a production history for five or six years before Pearl Harbor. Some manufacturers who started business after Pearl Harbor, located in easy labor areas, have already been permitted to produce some civilian items. It seems likely, however, that the pre-Pearl Harbor status will have considerable bearing on the civilian production program when it really gets under way.

VITROLINER
Porcelain Enameled
SMOKE JACKS

Porcelain Enameled Smoke Jacks are now specified in certain areas for Smoke Jack replacement and new construction.

Vitroliner meets Government specifications and is listed by Underwriters Laboratories for all fuels.

Write for prices and details on Government work.

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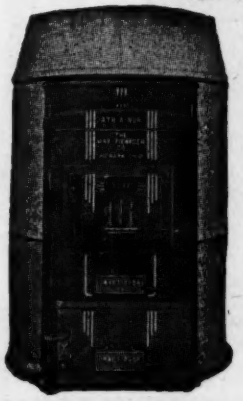
122 S. Michigan Ave., Peoples Gas Bldg., Chicago 3, Ill.

ATH-A-NOR
Furnace Repair Parts

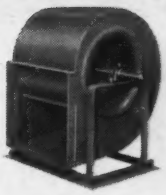


The furnace choice of dealers who know performance and saleability has been Ath-A-Nor for more than 50 years. Quality, economy and efficiency have always distinguished the Ath-A-Nor line. Replace with Ath-A-Nor to insure maximum performance and fuel economy! And continue to pile up scrap for munitions and see that it reaches government agencies speedily!

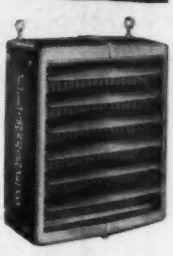
MAY-FIEBEGER COMPANY
MANUFACTURERS OF QUALITY HEATING EQUIPMENT FOR OVER 50 YEARS
NEWARK, OHIO

"Use CLARAGE PRODUCTS and Repeat Business Comes Easy!"

This nationally known, nationally accepted fan equipment helps you land desirable jobs—helps you KEEP desirable customers. It will pay to figure with us on any air handling or conditioning project. ***Write for Clarage catalog.***



FURNACE FANS



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EXHAUST FANS

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COMPLETE AIR CONDITIONING • COOLING • VENTILATION • FACTORY HEATING • MECHANICAL DRAFT • FANS and BLOWERS for INDUSTRIAL NEEDS

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APPLICATION ENGINEERING OFFICES IN ALL PRINCIPAL CITIES

● We offer a CASH payment of $5.00 for every accepted time-saving idea using E-Z-ON Damper Regulators.

● Most sheet metal men using E-Z-ONS have developed short-cuts in their daily experience that have helped them do better work faster. NOW you can help others—and help YOURSELF too—by sending those ideas in. Send in as many as you like.*

Send details about YOUR E-Z-ON time-saving ideas NOW! Mail them to—

*Five dollars will be paid to the first contributor of *each* accepted item or idea.

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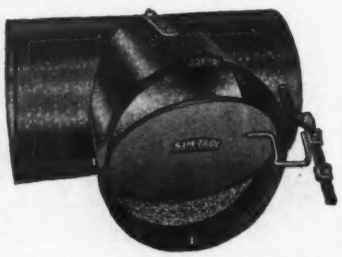
724 WEST WINNEBAGO STREET - MILWAUKEE 5, WISCONSIN

Simplex Automatic Draft Controls
For Greatest Fuel Economy

NEW RUST PROOF
5 *in* 1
"SIM-TROL"



The SIM-TROL control with Simplex adjustable sleeve is adjustable to breechings (or smoke flues) from 8" to 12" inclusive, which covers the range of most domestic heating plants. Will save up to 25% in fuel; maintains draft at 1/100 of an inch of the desired point under all conditions.

Type "A" Industrial Control

References, as to efficient operation and economies effected by Simplex Controls on plants of various sizes up to 1,800 H.P. can be furnished. In many cases savings of over 25% have been made.

Most complete line of Barometric Controls for every size heating plant. Write for full descriptive circulars.

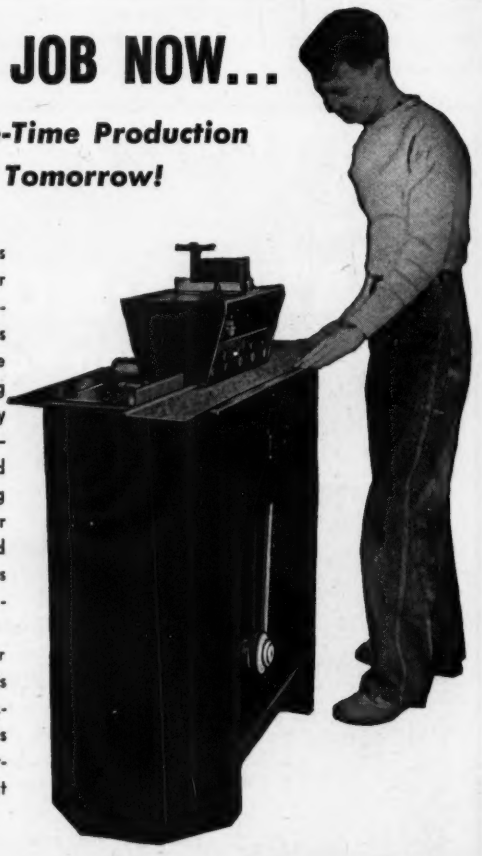
SIMPLEX
MANUFACTURING COMPANY
FOND DU LAC, WISCONSIN

The present trend is reflected in the larger place given to the Office of Civilian Requirements. It has recentiy been made a full member of the ultimate WPB Production Executive Committee. And it will have a member on the staff created by the Production Executive Committee which works intimately with Executive Vice Chairman Charles E. Wilson. This staff is composed of men of national and international stature from Army, Navy, Coast Guard, Maritime Commission, War Manpower Commission, Smaller War Plants Corporation, War Foods Administration, and similar agencies. Its special function is to plan military production cut back without interfering with maximum war production and to make the gradual switch to civilian production as smooth and as painless as possible. OCR also has been given full membership on the Surplus War Property Board, and on the Essential Activities Committees of the WMC. Finally, its representatives will serve as fully empowered members of all Area Production Urgency Committees.

"There is increasing evidence that the extremely high level of industrial activity, occasioned by the war, reached a peak last Fall and has been declining slowly," states the economist of the Bureau of Agriculture. "It is not likely that industrial production will show any marked drop while the war continues in both Europe and Asia, because over-all military demands probably will be maintained or increased during this period. Some further small declines in industrial production are possible in industries where military

WAR JOB NOW...

Peace-Time Production Tomorrow!



Lockformers with Power Flanger attachment as shown here are being used — day and night — to build ventilating systems for ships and countless other wartime tasks.

Lockformer meets today's high production demands —and tomorrow's stiffest competition.

The LOCKFORMER Co.
4615 Arthington Street **Chicago 44, Illinois**

needs are not particularly pressing. This may happen because unexpected changes in the military situation may indicate a need for more of some types of war goods than was originally planned and less of others. Unfavorable military developments might intensify the need for war goods and cause industrial production to rise again. Not only has the country reached a state of full employment with a considerably lengthened workweek, it has also greatly increased the output per manhour." John D. Keenan, WPB Vice Chairman for Labor Production, who was chosen for the post by the A. F. of L., recently challenged the workers to increase their production schedules by 10% during the next 6 months. Early in June, however, the members of the Iron and Steel Industry Advisory Committee came to Washington and served notice that neither labor nor equipment in the iron and steel industry can much longer stand the gruelling pace, particularly as developed in recent weeks. The most recent drive was attributed to the greatly expanded high-caliber shell program, stepped-up troopship construction and the great quantity of tin plate needed to pack the 1944 farm crop.

Organized labor has expressed its pride in the capacity of its membership to take the lengthened workweek and increased manhour output in its collective stride. But organized labor, which has strenuously fought the principle of the national service act, has not made a single comment upon the controlled referral plan. In contemplating the effect of the program it is illuminating to consider that roughly it is calculated, under normal conditions, manufacturing plants employ 23% of the total national work force. Farms, forestry and fishing use

IMPORTANT

Are you ready to meet the summer and fall demand for fuel-saving equipment?

See page 106

DASCO

Forged

HAND TOOLS

Chisels, punches, drills, nippers and numerous other hand tools . . . quality built for long service. Sold by leading jobbers.

DAMASCUS STEEL PRODUCTS CORP., ROCKFORD, ILL.

Perforated METALS

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. . . all its facilities and a wealth of experience in the perforating of metals and other sheet materials to further the essentials of war. Round hole perforations are available in a wide range from as small as .020" dia. to 7" dia.—slot and oblong holes are made as narrow as .008" and as wide as required. Write us for any information needed.

ANY METAL—ANY PERFORATION

The Harrington & King PERFORATING CO.

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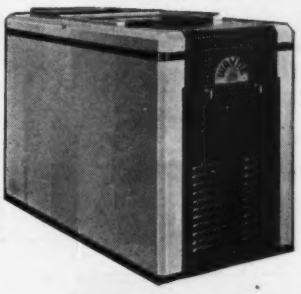
WAYNE OIL-FIRED



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60,000 to 400,000 B.T.U.

PROMPT SHIPMENT

on proper priority

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WAYNE'S V-DAY LINE WILL BE COMPLETE

OIL-FIRED, GAS-FIRED, COAL-FIRED FURNACES, STOKERS, BOILERS, WATER HEATERS. CONVERSION BURNERS FOR OIL AND GAS.

LINE UP WITH WAYNE FOR POST WAR PROFITS

WILL WILLIE WILLIAM BILL

4 Little "Fitting" Guys Fighting For You!

Will cuts installation costs—Willie makes fittings fit—William keeps prices down to bed rock—and Bill sees that there is stock near you.

FLASH NEWS! Complete, simplified line Gravity Pipe and Fittings now available on rated orders—24 hour service and shipments.

FREE: Complete, easily understood gravity pipe and fittings catalog showing full simplified line. Write Dept. 2 for prices and catalog.

THE WILLIAMSON HEATER COMPANY
CINCINNATI 2, OHIO

WILLIAMSON
WARM AIR FURNACES

19%; wholesale and retail trade, 17%; personal services, 9%; professional and related services, 7%; construction, 5%; Government 4%; finance, insurance, and real estate, 3%; mining, 2%; business and repair services, 2%; amusement, recreation, and related services, 1%; unreported industry, 1%. The controlled referral program applies to all activities employing males except agriculture. When you discuss the probabilities with WMC personnel it does not appear likely the full purpose implied by the regulations will be enforced. It is not an unknown experience, however, to find in the end that an implied law is eventually operated in its most literal sense, and that unexpected meanings have been connoted which have developed under special circumstances.

ECON-O-COL
the "Stronghearted"
STOKER

ECON-O-COL Automatic COAL BURNER

ECON-O-COL STOKER DIVISION
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Sand-Grind-Brush
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7" Special $53

These husky tools drive abrasive discs, wire brushes, grinding wheels and other attachments . . . make quick work of removing paint and rust, smoothing welds and casting ridges, and many other metalworking jobs. Powerful Universal motors. See your Black & Decker Distributor, or write to: The Black & Decker Mfg. Co., 782 Pennsylvania Ave., Towson-4, Maryland.

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DRILLS, HOLE SAWS, DRILL STANDS, LECTRO-SHEARS, BENCH GRINDERS, SANDERS, PORTABLE GRINDERS

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THRU LEADING JOBBERS EVERYWHERE

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Majestic FURNACES
For Better Heating!
Handled Exclusively Through Established Dealers

Seasoned With 40 Years Experience

. . . In New Developments For The Future

The Majestic Co., 912 Erie St., Huntington, Ind.

It is obviously impossible for any living being to foresee what may issue from this adventure in controlled service. But it is not difficult to perceive that only the highest type of patriotic public official, and the utmost vigilance, will help the country to make certain that these extraordinary powers will not be used with improper partiality, either from the standpoint of economics, sociology, and particularly from the standpoint of politics. Abuse of the powers would be relatively easy. And it will be particularly easy to apply the rigor of the regulations to those engaged in Small Business. The foregoing figures reveal that the vast majority of Americans are NOT engaged in manufacturing. But the object is to shift the vast majority to manufacturing activities. It is patent that only the utmost care will prevent the destruction of the smaller unit of the American economy by the imposition of the employment ceilings.

HELP . . .

equip your community . . .
NOW . . . to combat the
fuel shortage next winter!

See page 106

No. 18
Hand
Power

★ CUT ANY SHAPE
★ CUT ANY SIZE SHEET
★ SIZES FROM 18 GAUGE TO ½".

MARSHALLTOWN THROATLESS SHEARS

Here's just the Shear that offers every feature you want. It does hundreds of odd shearing jobs better and faster—yet is an inexpensive hand operated tool. Send at once for Shear Bulletin. It gives all details of the Marshalltown line of sizes from 18 gauge to ½ inch capacity.

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Just use it once—

The Alnor Velometer

gives you instantaneous, direct readings of air velocity in feet per minute. Hold it in the air stream for low range readings; use the tube-connected special jets for high range readings or inaccessible locations. That's all there is to it, and once you use the Alnor Velometer you will never tolerate other methods.

The Alnor Velometer is built in several standard ranges from 20 fpm to 6,000 fpm, and up to 3 inches static or total pressure. Special ranges available as low as 10 fpm, and up to 25,000 fpm and 20 inches pressure. Write for Velometer bulletin.

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PRESTO! The IRON is BRIGHTLY TINNED

FARCO BRICK is pure, processed Sal-Ammoniac for cleaning and tinning soldering irons in a jiffy. Just heat the iron rub on brick—add Solder.

FARCO BRICK is of uniform hardness. Does not contain moisture absorbing binder thereby eliminates crumbling and breakage. Gives Longer service on the bench or in tool kit. Packaged in especially designed container with metal top and bottom.

SPECIAL OFFER F. O. B. Phila., Pa.
6 — 1 lb. Containers $3.00
6 — ½ lb. " 1.75
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Here's a useful tool for busy war plants doing soldering. These brushes are made to meet highest standards with tinned handles to resist acid. Selected, stiff brushes keep their shape under constant use. Available in three sizes — ¾", ½" and ⅜" width bristles. Price per gross, $3.00, $4.00 and $5.00 respectively F. O. B. Phila., Pa.

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1245 N. 26th Street, Phila., Pa.
Consult us if you need U. S. Specification Fluxes

Demand Ahead

For fuel-saving controls to help meet the fuel shortage next winter. Start installing now. See page 106

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For all

Furnaces - Boilers - Stoves

GUARANTEED TO FIT

All indications point to a shortage of repair parts. Get your orders in to us while we still can supply you.

Now we can give you prompt attention as our stock is very complete.

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2100 Washington Ave. St. Louis, Mo.

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PORTABLE SHEARS

Your work will proceed faster and neater when you use Bremil Portable Shears on the job or in the shop. Write today for literature showing complete line.

ALL-ALLOY No. 2 cuts up to ¼" steel plate.
ALL-ALLOY No. 1 cuts up to No. 11 gauge strip or sheet.
Special blades may be obtained for shearing stainless steel.

BREMIL MFG. CO., ERIE, PA.

Remember COLE HOT BLAST *Gas-Fired* FLOOR FURNACES

Will again be on the market after it's over, but now it's war work.

COLE HOT BLAST MFG. CORP.

3108 W. 51st St. Chicago 32, Ill.

Modernize Your Accounting System

(*Continued from page* 51)

old-fashioned bookkeeping methods. We have entered a new era in barter. The businessman who expects to emerge from the duration in the pink of financial condition and earn maximum profits in the postwar period must use an accounting system as modern as his air conditioning and automatic heating installations. This article will, therefore, be the introduction to a series of articles which will explain a "streamlined" accounting system suitable for the warm air heating and sheet metal contracting industry.

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Quality Asbestos Products for all types of insulation. Asbestos Papers, Millboards, Aircell Papers and Pipe Joint Tape. Pipe Covering for all kinds of steam, hot and cold water lines.
Asbestos Cements, Ductboard and Supply Duct.

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BARBER BURNERS

For ALL Gas Appliances

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The Modern **SHEET METAL**

- SUPERIOR TO GALVANIZED IRON
- WEATHER PROOF
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REPAIRS FOR ANY FURNACE BOILER OR STOVE

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Abundant with up-to-date shop ideas for defense contract jobs, aircraft maintenance, sheet metal replacement parts, machine shop bench hand work on small hand working fixtures, and other useful data on BLUE PRINT READING, sheet metal drafting, layouts, pattern making, precision hand filing, assembly, riveting, etc.

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CHICAGO STEEL BRAKE

BEST BY FORTY-TWO YEARS TEST

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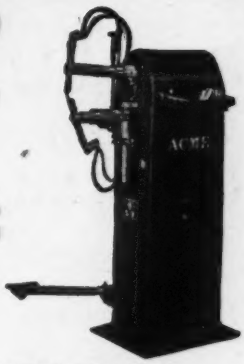

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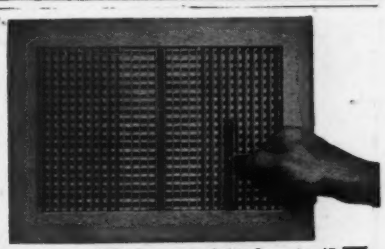

Design 5050VA—Made in all Standard Sizes; special sizes made to order. Vertical bars on face are adjustable in groups; horizontal bars on back are similarly adjustable. Back louvres can be adjusted from face. Allows vertical deflection of air to right or left from straight flow to 45 degrees right and 45 degrees left; horizontal deflection upward or downward from straight flow to 45 degrees either direction.

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STANDFORATED

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Throatless shears that cut any shape . . . straight, circular or irregular. FASTER—Precision—accuracy! Order No. 1 for 14 gauge. No. 2 for 10 gauge. No. 3 for 3/16 inch mild steel and 10 gauge stainless.

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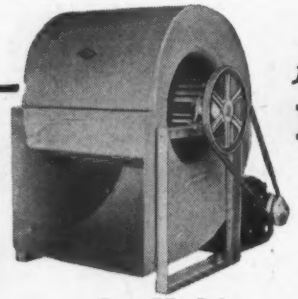
COMING

Next winter . . . a possible critical fuel shortage.

This summer...big demand for fuel-saving equipment.

See page 106



Type EB—Belt Sizes 6" to 16"

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• The Properaire Line gives you prompt delivery on all types of blowers for any air-moving task. They're easily adapted to your installation problems. Priced right.

Inquire of your Jobber or write direct to factory for your copy of latest literature. Bulletin 1202.

Grand Rapids Die & Tool Co.

1202 Godfrey Avenue, S. W. Grand Rapids 2, Mich.

☆ WAR TIME

The Wheeling Plant of the **Wheeling Corrugating Company**, Wheeling, W. Va., is in receipt of the third "E" award by the War Department. The award gives the employees and management the privilege of inserting the second white star in the Army-Navy "E" flag that flies over the plant.

The original award was made by Under Secretary of War Robert P. Patterson on October 24th, 1942. Again in September 1943 the Wheeling Corrugating Company received the second award carrying the white star.

◆

The Turner Brass Works, Sycamore, Illinois, has just published "The Story Behind the Turner Brass Works," with interesting facts about the company, the honor roll of those serving our country's colors, the Army-Navy "E" award in November last, the products in war time use (camp stove and life raft or "paraboat"), and finally the peace time products, scenes in the office and factory, with a map on the last page to designate their location sixty miles west of Chicago.

◆

The Kresky Manufacturing Company, 307 Third Street, Petaluma, California, manufacturer of oil burning equipment, has been awarded the Army-Navy "E." Captain Floyd C. Bedell (CEC), U. S. N. Public Works Officer, Navy Yard, Mare Island, made the presentation, accepted by President C. A. Miller, on behalf of the company.

Col. John W. Weltman, of the Army Air Field, Santa Rosa, presented the Token Army-Navy "E" pins, which were accepted for the employees by William Frengle and Marietta Morgan.

◆

Marshall Furnace Co., Marshall, Mich., is making bronze marine propellers, parts for Diesel marine engines, parts for car unloaders and lift trucks, parts of overseas laundry boilers in gray iron, and furnaces for civilian use. About eighty per cent of their present business consists of war orders. Two former engineers are in the service. They are **Lucius Tanner**, in England; and **Vern Kraushaar**, in the South Pacific.

The company has built an entirely new bronze foundry and made some changes and additions to both plant and equipment in the gray iron foundry.

Employees have been on a ten per cent war bond basis for some time.

Thirty-seven former employees of the office and shop force are in service—about sixteen per cent of the total. About half of these are overseas or on board ships of Navy and a number have been in action.

About fifteen per cent of the dealer organization is now in defense plants and working for government agencies, about forty-eight per cent of the dealers are in service, and nineteen are overseas. Two are prisoners (one of the Japs and one in Europe) and two have been killed in action.—R. W. Stout.

REPAIR PARTS

for any and all makes of

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Also MODERNAIRE FURNACES

Fittings, Registers, Supplies

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Since 1869

TRADE NEWS ☆

Fitzgibbons Boiler Company, Inc., 101 Park Avenue, New York 17, has received the second Production Award for continued excellence in the manufacture of war products at their plant in Oswego, N. Y.

First in the War Production Program came the General Grant M-3 welded tank hulls which were supplemented with heat exchangers and other equipment for the high octane gasoline and synthetic rubber programs. Then the tank program was stepped up with the addition of M-4 General Sherman combat tank hulls and Fitzgibbons was asked to concentrate its entire output on this urgently needed combat unit. Additional tonnage and production was absorbed in the manufacture of certain welded parts for the Essex Class Aircraft carriers such as the Bennington, Shangri La and Bon Homme Richard, recently launched.

At present Fitzgibbons is continuing with the Navy Aircraft Carrier fabrication program and has embarked upon a new schedule of M-7 tank destroyers and special high pressure boilers for the U. S. Army 2-8-0 consolidation type locomotive and the 2-10-0 Russian locomotive.

◆

General Controls Co., Glendale, California, was awarded the Army-Navy "E" for excellence in producing automatic controls for aircraft and ordnance at impressive and colorful ceremonies March 29, 1944.

Major Howard H. Adams, District Public Relations Officer, A. A. F., Materiel Command, was master of ceremonies. Main address and presentation were made by Major Justin C. Gunnison, A. A. F., 12th Air Force, who has to his credit a total of eighty bombing missions in the Mediterranean theatre. **W. A. Ray**, president and chief engineer of the company, accepted the Award, pledging continued effort and performance on the part of all 800 men and women of General Controls.

Presentation of Award Pins was made by Lieut. Malcolm B. Hoyt, Bureau of Aeronautics General Representative, W. D., Navy Dept. **John Peterson**, disabled World War II veteran, now drill press operator, and **Henry Latter** and **Carol Wilson**, oldest employees, accepted for the employees.

General Controls manufactures a complete line of automatic temperature, pressure and flow controls.

◆

Campbell Heating Company, Des Moines, Iowa, reports nearly all their work essential, although they have no war contracts.

Bowen Campbell, vice president, is Major of 153 Field Artillery Battalion somewhere on the East side of the Atlantic, according to **Horace Campbell**, President. The following are also in service:

Elwood A. Arndts, a salesman with headquarters in Minneapolis, is now in the Navy at Windham, Ohio.

Ramsey J. Petersen—Northern Iowa—is now manager MRD Engineers Warehouse, Leavenworth, Kansas (Army).

Several former factory workers have seen action.

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Two trade marks to remember when you want the height of efficiency, beauty and low cost combined in registers and intakes.

AIR-VANE NO STREAK

Dealers Net Estimating book, a time and money saver, sent free upon request.

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THAT IS SOMETHING TO SELL
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FURNACES and WATER HEATERS
J. L. GILLEN CO.
DOWAGIAC • • MICH.

us Patented Monogram Vaporizing Burner
ides Highest Known Operating Efficiency with Oil
Forced Air Conditioners
Utility Room Units
Booster Gravity Units
Automatic Water Heaters
QUINCY STOVE MFG. COMPANY, Quincy, Illinois

THIS IS A GOOD TIME TO CONSIDER THE MERCOID VISAFLAME (LIGHT ACTUATED) CONTROL SYSTEM
The possibilities of improved oil burner design and performance are unlimited with the use of the Visaflame. In your plans for the future, it will pay you to investigate. Let our engineers show you what can be done. There is no obligation.
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4219 Belmont Ave., Chicago, Illinois

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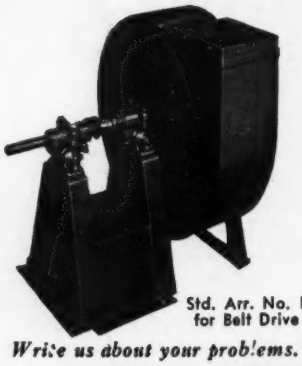
DIAGRAM shows how special streamlined inlet deflects airstream so as to reduce turbulence and back plate erosion. Result: higher over-all efficiency, lower maintenance cost, less time out for service and repairs.

SEND FOR DETAILS *including performance and dimensions in Catalog 410.*

B. F. STURTEVANT COMPANY
HYDE PARK BOSTON 36, MASS.



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New and Improved "EX" Fans are now available in standard sizes from No. 15 to No. 80 and from 200 to 30,000 CFM Capacity with pressures up to 15" W.G. These fans are commonly used for exhaust problems to handle dust, fumes, shavings, etc., but can be adapted for forced draft service.

"EX" Fans are furnished in all standard arrangements of the N.A.F.M. The design is such that it can be easily modified to suit special assemblies, thus "EX" Fans are ideal for resale purposes, as part of factory assembled units.

Write us about your problems. Send for Bulletin No. EX-41

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- ✓ Design features that sell
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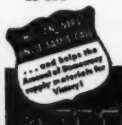

THE HEIL CO.
GENERAL OFFICES: MILWAUKEE, WISCONSIN

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WANTED

Wanted to buy—Complete patterns and core boxes for 20", 22", 24", 26", 28" Cast Iron Furnaces, late type slip fronts. Please submit details and prices to Key No. 585, American Artisan, 6 N. Michigan Ave., Chicago 2, Ill.

WANTED SURPLUS EQUIPMENT—Fans, Blowers, Motors, Cooling Coils, Heating Coils, Unit Heaters, etc. Send list of items available and state cash price and whether priority is required. Air Conditioning Engineering Co., 90 Memorial Drive, Cambridge 42, Mass.

FOR SALE

FOR SALE—No. 196F Niagara Foot Squaring Shear; No. 1236 Libert Shear; No. 0547 Pexto 18 ga. Turner; Hobo or Original Metal Forming Machine; No. 18-P Marshalltown Shear with motor; No. 18 Lockformer Power Flanger; Maplewood Model F. Flanger; Pittsburgh Lock Air Hammers; 4 and 8 foot Chicago Brakes; No. 1014 Chicago Brake; nearly all 99 per cent new. The S. J. Johnson Co., 7330 Puritan Ave., Detroit 21, Michigan.

FOR SALE—Power Crimping Machine for sheets 30" wide; double housing type with 3/16" crimp; back geared with flywheel pulley; attractively priced for quick sale. The S. J. Johnson Co., 7330 Puritan Ave., Detroit 21, Michigan.

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*Finer, more uniform spray.
*Effective operation at Low Pressures. * No internal parts to clog or wear.

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No More Changing of Irons

Always the Right Amount of Heat for the lightest as well as the heaviest Jobs. Especially adaptable for soldering with Victory Solder.

Quick set dividers—fastest and most accurate on the market—two sizes for circles up to 36" and 48". Guaranteed—Order now.

REINER & CAMPBELL CO., Inc.
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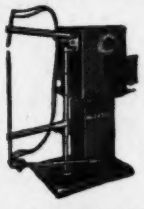
WELDING HEADQUARTERS



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CHAS. EISLER
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Trademark
YAGER'S Soldering Salts — Paste
Reg

Two standard fluxes for all soft soldering. Safe, quick, certain. Buy them at your jobbers or write us if he cannot supply you.

½ lb., 1 lb., 5 lb. cans; 2 oz., 8 oz., 12 oz.

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POWER: 42" LEFFLER; 60" NIA. PIPE;
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UNIVERSAL; NO. 1½ HENDEY NORTON;
VERTICALS: NOS. 2 & 3 B & S; NO. 2½-B KEARNEY & TRECKER;
PUNCHES
HAND: NO. 10 EXCELSIOR, 19" throat; NO. 44 NIAGARA, 9/32" thru 12 gauge; NO. 40 WHITNEY. 5/18" thru ½";
DEEP THROAT: NO. 15 TOLEDO; NO. 20 EXCELSIOR; NO. 135-A NIAGARA;
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NOS. 335, 255 & 254 CHGO. STEEL;
10 FT. POORMAN;
ROLLS
POWER: 12' HILLES JONES, ⅜" cap.; 10' BERTSCH. ⅜" capacity;
ANGLE: 6x6x⅜" WICKES;
LEVELLER: 5' NILES, 7 Rolls, 6¼" dia.;
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RING & CIRCLE: NO. 510 NIAGARA, ⅜" cap.; 10 ga. LENNOX CIRCLE SHEAR; QUICKWORK, Shears 5/32", Flanges ⅛";
ROTARY: 14 ga. YODER;
SPOT WELDERS
50 KVA SWIFT; 20 KVA GIBB; 25 KVA & 20 KW THOMPSON; 15 KVA-AEF; 55 KVA SWIFT BUTT; 35 KVA GUN;
WIRE STRAIGHTENERS
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MISCELLANEOUS ITEMS
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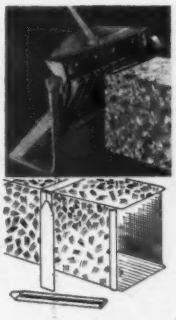
NO. 737 PEXTO FOOT NOTCHER;
20 FT. DRAW BENCH.

SEND FOR COPY OF "MACHINERY MART"

INTERSTATE MACHINERY CO., INC. YARDS 5800
1433 W. PERSHING RD., CHICAGO 9, ILL.



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No. 12 takes all sizes up to 12".

No. 18 takes all sizes up to 18".

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BLOWERS
EXHAUSTERS
"Lungs for Industry"

REBUILT and GUARANTEED
Prompt Shipments From Large Stocks
All Types—All Makes—All Sizes
And We Really Rebuild 'Em

Why Wait Months for New?

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SNIPS

No. 185. Small Size
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For Cutting All Kinds of Metals

For Immediate Delivery
A Real Precision Tool

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Write for Details
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Flats
Squares
Angles
Rounds
Channels

BENJAMIN WOLFF & COMPANY
PRIME STEEL SERVICE
CHICAGO

More advantages for you

Many hundreds of Midwest buyers rely on Wolff for bars for two good reasons. Reason No. 1 is quality. All stock is arrow straight, clean, with a tight adhering scale, made by outstanding mill sources, and backed by chemical analysis that can be furnished on request. Reason No. 2 is Wolff Service. It's not the ordinary garden variety of take-it-or-leave-it service you've come to expect from ordinary sources of supply. Rather, Wolff Service is based on the complete, co-ordinated cooperation of everyone from the time your order is received, through any required cutting, sawing or galvanizing of stock. It's the kind of service that gets things done for you and gets them done right, so that you can do your work better and faster. Call Wolff for bar stock.

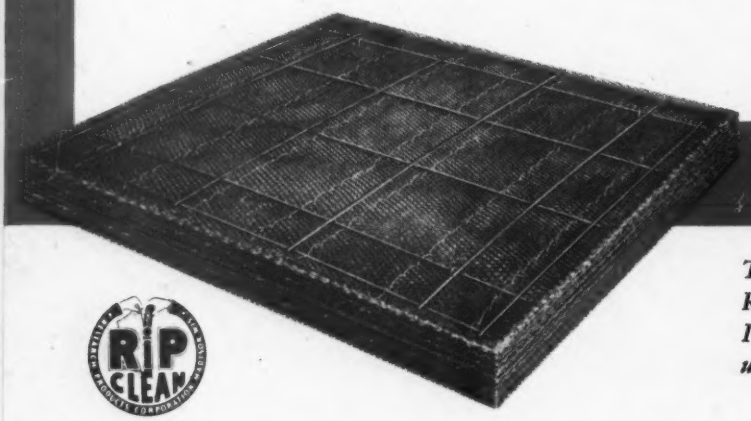
BENJAMIN WOLFF AND COMPANY
58th St. at Seeley Ave. Chicago, 36 Ill.

The Trouble —

"Air Conditioning Asthma"

The Cure —

RESEARCH AIR FILTERS



The No. "200" Series Research Air Filter... with the Re-Fil-Able filter pad held between hooked wire grids. Its "oversize" self-seals and prevents by-passage of unfiltered air.

RIP CLEAN

The efficiency of an air conditioning system is, in great measure, dependent upon the filters. If they are dirty and clogged, the free passage of air is stopped and the asthmatic-acting equipment overworks.

Right now suggest clean RESEARCH AIR FILTERS to your customers. They are easy to install, and a good profit-maker for you—and at the same time they insure clean air.

FREE CATALOG of FILTER SIZES

Makes it easy to service air conditioning units. Tells at a glance the number and size of Research Air Filters needed. Write Dept. A6.

Now Is The Time

—to go after this air filter business. Write us for details of our tested and proven "Time To Change" selling campaign.

RESEARCH PRODUCTS CORPORATION

Madison 3, Wisconsin